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**PATENT APPLICATION  
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

P.O. Express: ET79110699203

**RECEIVED**

APR 09 2004

**OFFICE OF PETITIONS**

In re Application of:

WILLIAM COLIN BASFORD

Filing Date: 06/08/2001

Serial No.: 09/877,585

For:

**AERODYNAMIC COMBINATION FOR  
IMPROVED BASE DRAG REDUCTION**

(As Amended)

Patent Examiner:

Patel, Kiran B.

ART UNIT: 3612

April 6, 2004

Hallowell, Me 04347

#19  
#20

**PETITION TO THE COMMISSIONER FOR:**

**1. NULLIFICATION OF NOTICE OF ABANDONMENT**

**2. ALTERNATIVELY, FOR REVIVAL (37CFR Sec. 1.137(a) or 1.137(b))**

Honorable Commissioner of  
Patents and Trademarks  
P.O. Box 1450  
Alexandria, VA 22313 - 1450

Dear Sir:

This is a Petition under Section 711.03 of MPEP to render null and void an invalid Notice of Abandonment issued in the above-identified application by Examiner, Kiran B. Patel. Such nullification is mandatory in order to restore trust and confidence in the PTO Mail handling capabilities, and to protect the client's interest in his protection for a major contribution in the applicable art.

04/08/2004 CNGUYEN 00000100 09877585

01 FC:2453  
02 FC:2452

665.00 DP  
55.00 DP

If the improper Notice of Abandonment is allowed to stand, the message being sent to all Patent Attorneys is twofold:

First: Don't trust the PTO Mail Room.

And second; Above all don't supply missing documents as assistance in correcting the contents of an incomplete case file.

This petition is also being brought under 37CFR Section 1.137(a) to revive an unavoidably abandoned application; or in the alternative under 37CFR 1.137(b) to revive an unintentionally abandoned application. It was clearly unavoidable since the PTO mail room has lost a series of crucial documents - documents which preclude any chance of abandonment.

At all times prosecution has been timely and directed toward an early allowance. Having done all possible to obtain allowance - including filing a Notice of Appeal and an Appeal Brief - the receipt of an improper Notice of Abandonment is discouraging. At a time when the Examiner's Answering Brief on Appeal was expected, the Examiner instead issues a Notice of Abandonment. Correction is mandatory.

Succinctly stated, the basis for nullification is that many timely-filed documents - including Applicants Notice of Appeal and Applicants Appeal Brief - are apparently missing from the case file. There is a legal presumption that documents properly addressed and placed in the mail are delivered to their destination. The enclosed Declaration by the Attorney of Record attests to the timely post office deposit of such documents - all of which included a signed declaration of mailing.

It now appears that at least three separate documents timely filed by the Attorney - and all of which weigh against abandonment - are apparently missing from the case file. Moreover, the Examiner has based his Notice of Abandonment on the receipt date of a duplicate set of faxed documents sent in by the

undersigned Attorney in an effort to help the Patent Office correctly rebuild an incomplete case file.

In support of this Petition Applicant relies upon the facts set forth below, the enclosed Declaration and Exhibits from the Attorney of record, Stanley R. Jones, Esq., and the contents of the record on file in the Patent Office.

Briefly stated Applicant will show herein that:

1. The Application was never abandoned, but rather it was duly and timely amended well in advance of the shortened three-month statutory time set for response. That timely amendment was refused entry by Examiner Patel. This after-final amendment included a Declaration by the Applicant setting forth both a technical and legal basis for removing Examiner Patel from further examination of this application. In addition, it included a request for:

- A. A new Examination,
- B. A change of Examiners, and
- C. Removal of the final rejection.

2. The final rejection issued by Examiner Patel on May 27, 2003 was both premature and done without adequate or sufficient consideration on the merits. In view of that premature final rejection, Applicant's Attorney specifically checked with Acting Supervisory Examiners Pedder and regular Supervisory Examiner Glen Dayoan as how best to proceed.

Attorney Jones was advised by Supervisor Dayoan - following that Supervisor's case file review - to file a Petition to the Commissioner under 37 CFR 1.181 for Reconsideration of the Final Rejection under 35 USC 112. The Attorney additionally checked with the PTO information clerks about the time and fee schedule, and was advised that no fees for that 1.181 Petition were required. The

suggested Petition for Reconsideration (Exhibit 2 to the Jones Declaration) was then timely filed.

3. Applicant's Attorney has tried in vain to find out the present status of documentation in the case file by telephoning both Examiner Patel and the file clerk, Danielle T. Jones. But, the timely-filed Petition for Reconsideration is not present in the case file. Applicant also duly and timely filed a Notice of Appeal (Exhibit 3 to the Jones Declaration) but apparently that Notice of Appeal is also not present in the case file. Then within two months after the Notice of Appeal, Applicant timely filed his Appeal Brief (Exhibit 3 to the Jones Declaration). Apparently that Appeal Brief is not in the file either.

4. At this point in the proceedings, Applicant has filed a total of five (5) documents in response to a premature and incomplete Office Action. At least three (3) of those documents are missing from the case file. When contacted by the PTO about the file status, Applicant's Attorney faxed duplicate copies with proof of mailing statements to the PTO. Now those documents have been used against the Applicant. Examiner Patel has relied upon the date of receipt of the faxed duplicate documents as his basis for a wrongful assertion of a failure to reply in a timely manner.

5. The Notice of Abandonment is clearly improper and must be withdrawn. Indeed, it is respectfully submitted that the case should be allowed and passed to the Issuance Branch for a formal Notice of Allowance.

### **FACTS IN SUPPORT OF PETITION**

1. Examiner Kiran B. Patel issued an improper Notice of Abandonment dated March 22, 2004 in which it is wrongfully asserted that Applicant failed to timely reply to an outstanding Office Action dated May 27, 2003. In point of fact, however, a timely amendment dated July 26, 2003 was filed within two months

following the May 27, 2003 final rejection. A copy of that Amendment together with Inventor Basford's Declaration is attached as Exhibit 1 to the accompanying Declaration of Stanley R. Jones. Since that filing was clearly proper in all respects, and was well within the shortened three month period, no extension of time became due and no payments were required

2. The Amendment of Exhibit 1 to the Jones Declaration included a Declaration by the inventor William Basford setting forth reasons why Examiner Patel should be removed and why no adequate Examination had taken place. Both the amendment and the inventor's Declaration, were denied entry by Examiner Patel. Telephone calls were placed to Acting Examiner Pedder to find out if Examiner Patel had been removed as requested. On October 17, 2003 an Advisory Action was issued by Examiner Patel.

3. The undersigned and Examiner Glen Dayoan had further telephone discussions concerning the lack of any material examination and whether or not Examiner Patel was going to be replaced. Mr. Glen Dayoan reviewed the case file, and stated that a Petition for Reconsideration was in order.

4. Based on the discussion with Supervisor Dayoan, a Petition for Reconsideration - Exhibit 2 to the Jones Declaration - was filed on November 26, 2003. In keeping with Supervisor Dayoan's instructions the Petition for Reconsideration was limited to the 35 USC 112 issue. Attorney Jones called the PTO information number, and after explaining the timetable involved, was assured that no fees need accompany that Petition for Reconsideration.

5. Also on November 26, 2003 a Notice of Appeal was filed. And two months later on January 26, 2004 Applicants Brief on Appeal in triplicate was filed.

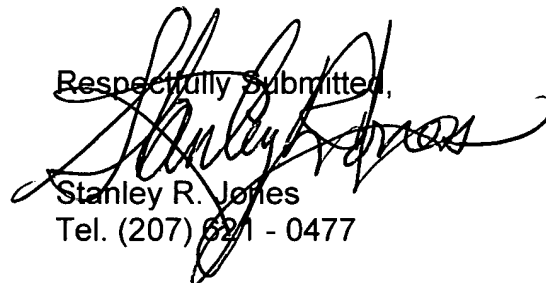
6. Applicant hereby petitions to revive an unavoidably abandoned application. Enclosed is a small entity check for \$55.00. The grounds for this

alternative petition are set forth above, and clearly establish that, if abandoned, it was an "unavoidable" abandonment. Documents timely mailed were apparently lost in the PTO Mail Room. It certainly constitutes an unavoidable situation when such a timely amended case is held abandoned because of lost documents. "Unavoidability" has been established and thus this case should be revived on such grounds.

7. Additionally, and to fully protect the client's interest in this valuable patent property, an additional check in the small entity amount of \$665.00 is also enclosed as payment for a Petition to Revive on the alternative grounds of "unintentional" abandonment. Both of these Petitions for Revival are alternative only, and the primary relief sought hereby is a nullification of an improper Notice of Abandonment by Examiner Patel.

8. If questions arise, the Petition Reviewer is invited to contact the undersigned at the number supplied below.

Respectfully Submitted,



Stanley R. Jones

Tel. (207) 621 - 0477

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO: COMMISSIONER OF PATENTS AND TRADEMARKS, P.O. Box 1450, Alexandria, VA 22313 - 1450 ON April 6, 2004 (DATE OF DEPOSIT)

BY:  (REGISTERED REPRESENTATIVE)



## OFFICE OF PETITIONS

April 7, 2004  
Hallowell, Me 04347

timely reply to an outstanding Office Action dated May 27, 2003. In point of fact, however, a timely amendment dated July 26, 2003 was filed within two months following the May 27, 2003 final rejection. A copy of that Amendment together with Inventor Basford's accompanying Declaration is attached as Exhibit 1. That filing was clearly proper in all respects, and was well within the shortened three month period, no extension of time became due and no payments were required

2. Both the amendment and inventor Basford's Declaration, were denied entry by Examiner Patel. Telephone calls were placed to Acting Examiner Pedder to find out if Examiner Patel had been removed as requested. Additionally, the undersigned and Supervisory Examiner Glen Dayoan had further telephone discussions concerning the lack of any material examination and whether or not Examiner Patel was going to be replaced. Mr. Glen Dayoan reviewed the case file, and suggested that a Petition for Reconsideration limited to the 35 USC 112 issue was in order. A copy of that timely Petition for Reconsideration filed on November 26, 2003 is attached hereto as Exhibit 2.

3. The undersigned called the PTO information number, and after explaining the timetable involved, was assured that no fees were necessary for filing the above-mentioned Petition for Reconsideration.

4. Also on November 26, 2003 a Notice of Appeal (Exhibit 3 hereto) was filed. A copy of that Notice of Appeal was filed within the six (6) month statutory period. And two months later on January 26, 2004 Applicants Brief on Appeal (Exhibit 4 hereto) was filed in triplicate. (Because of volume constraints only the cover sheet of the Appendix to Exhibit 4 is included.)

5. After Basford's Brief on Appeal was on file, the undersigned on February 10, 2004 received a call from Ms. Danielle Jones asking about the case file documents. I advised Ms. Jones that a Petition for Reconsideration, a Notice of Appeal and an Appeal Brief had been filed. She requested that I send by



Facsimile a copy of the Petition to the Commissioner under 37 CFR 1.181 and a Notice of Appeal since she did not have copies of such documents in the case file. I complied and a copy of my covering letter is enclosed as Exhibit 5.

6. At all times I have sought to timely file responsive documents leading toward allowance of the above-identified application. At no time did Applicant seek or intend to abandon this Application. I believe the Notice of Abandonment to be improper and request that it be nullified.

7. Additionally, on behalf of Applicant Basford I hereby petition to revive on the basis of an unavoidably abandoned application. Enclosed is a small entity check for \$55.00. The grounds for this alternative petition are set forth above and in the accompanying Petition. Such a showing, it is respectfully submitted, clearly establishes that, if abandoned in fact, the Basford Application was an "unavoidable" abandonment.

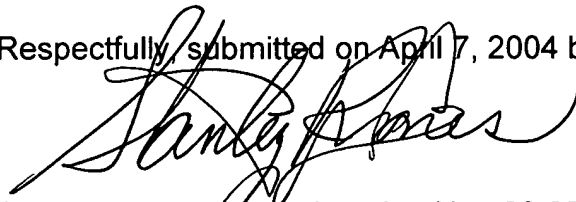
8. Documents timely mailed have apparently been lost in the PTO Mail Room. It is understood that the experienced PTO Mail Room employees have been replaced by outside source contractors and that orderly mail handling has been disrupted. I fear that timely and properly addressed documents described above have been lost - most likely by the PTO mail room staff. When one does all that is required - and timely amends a case - it certainly constitutes an unavoidable situation when such a timely amended case is held abandoned because of lost documents. In addition to a Petition for Reconsideration, a Notice of Appeal and an Appeal Brief are all missing from the case file. "Unavoidability" has been established and thus this case should be revived on such grounds.

9. Additionally, and to fully protect the client's interest in this valuable patent property, an additional alternative check in the small entity amount of \$665.00 is also enclosed as payment for an alternative Petition to Revive on the grounds of "unintentional" abandonment. Both of these Petitions for revival are

being sought as alternative remedies. The primary relief sought hereby is the nullification of an improper Notice of Abandonment by Examiner Patel.

10. This paper has been promptly prepared following a work schedule revision and has been done in a good faith effort to revive and/or nullify a grave miscarriage of justice caused by the Notice of Abandonment. Inventor William C. Basford has a valuable invention covered by his patent property and it must be restored to a patent pending status as soon as possible. If any questions arise, the Petition Reviewer is invited to contact the undersigned at the number supplied below.

Respectfully submitted on April 7, 2004 by:

A handwritten signature in black ink, appearing to read "Stanley R. Jones", written over the typed name.

Stanley R. Jones, Registration No.: 22,659.

Telephone (207) 621 - 0477 .



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Basford, William C.	)	Patent Examiner:
	)	Patel, Kiran B.
Filing Date: June 8, 2001	)	
	)	ART UNIT: 3612
Serial No.: 09/877,585	)	
	)	
For:	)	
	)	July 26, 2003
<b>AERODYNAMIC COMBINATION FOR</b>	)	
<b>IMPROVED BASE DRAG REDUCTION</b>	)	
(Amended)	)	Hallowell, Maine
-----	)	Zip: 04347

**AMENDMENT**

Honorable Commissioner of  
Patents and Trademarks  
Washington, D.D. 20231

Dear Sir:

In response to the Office Action dated May 27, 2003 please note that this amendment is being timely filed within two months of the date that Examiner Kiran B. Patel made his rejection final. This amendment is believed to place this aerodynamic drag reduction invention in condition for allowance and thus must be entered.

**PLEASE AMEND THE SPECIFICATION AS FOLLOWS:**

Change the Title to read as follows:

**-- AERODYNAMIC COMBINATION FOR IMPROVED BASE DRAG REDUCTION --**

**Listing of claims:**

Claims 1 through 4, 11, 12, 14 through 25 and 30 are indicated by Examiner Patel as withdrawn.

Claims 5 through 10 and 13 are cancelled.

Claim 30 is believed to be improperly withdrawn and is amended below.

Currently Amend as follows:

-- 26. (Currently Amended.) Apparatus for reducing the fluid-dynamic base drag of a bluff body (20) moving through a fluid (21) and creating, at the rear of the body, a low pressure wake having an outer wake perimeter, which bluff body (20) has a substantially flat rear base surface (25), a pair of opposed side surfaces (22A and 22B), and opposed top and bottom surfaces all joined with said rear base surface at side, top and bottom trailing edges (24), respectively, so as to form a box-like container (30), said apparatus comprising:

means positioning side-by-side vortex generators in a linear array (40) ahead of the two side, top and bottom trailing edges (24) of said bluff body (20) for generating counter rotating stream-wise vortices in a fluid boundary layer (23) passing generally along said bluff body and creating from said layer separated shear surfaces (26) which turn sharply inward aft of said trailing edges (24);

four boattail plates (50) inset and affixed a predetermined distance from the top and side trailing edges(24); and

rear edges on said boattail plates (50) sized to intercept the separated shear surfaces (26) [of said fluid layer] at the outer perimeter of the low pressure wake, thereby providing maximum fluid-dynamic base drag reduction for said body. --

27. (Previously Added) The apparatus in accordance with claim 26 wherein the bluff body is a land vehicle moving in air, which vehicle has only three boattail plates attached adjacent the top and opposed side trailing edges; and

three linear arrays of vortex generators, one array each associated with one each of said boattail plates.

28. (Previously Added) The apparatus of claim 27 wherein the vortex generators are V shaped low drag vortex generators having an open end and a pointed end, and said apparatus further comprises:

said V shaped vortex generators in said linear arrays are positioned with said open end facing toward a forward end of said vehicle; and the pointed end of said V shaped vortex generators pointed toward the rear of said vehicle.

29. (Previously Added) The apparatus of claim 27 wherein said vehicle includes a truck trailer body with a rear opening into said box-like container, and further comprising:

boattail plate hinging means allowing said plates to swing clear from said rear opening for said trailer body.

30. (Currently Amended.) The apparatus of claim 27 wherein said trailer body has a pair of swinging rear doors vertically divided lengthwise top to bottom at about the center of the base surface, said [method] apparatus further comprising:

means dividing the top boattail plate at the point of division of the vehicle's rear swinging doors such that opening of the vehicle doors allows said boattail plates to separate and swing away together with the swinging doors of the trailer body.

31. (Previously Added) Apparatus for reducing the fluid-dynamic base drag of a bluff body in accordance with claim 26, and further comprising:

means positioning said affixing means at a predetermined inset distance of about 8 to 9 percent of the lesser of the height or width of said rear base surface.

32. (Previously Added) Apparatus for reducing the fluid-dynamic base drag of a bluff body in accordance with claim 26, said apparatus further comprising:

a front edge surface for each of said boattail plates; and

means hinging said front edge of said boattail plates to said base surface at said inset location.

33. (Previously Added) Apparatus for reducing the fluid-dynamic base drag of a bluff body in accordance with claim 26 wherein said boundary layer has a given local thickness, said apparatus further comprising:

a thickness height for said generators in the range of  $1/4$  to  $1/5$  said local boundary layer thickness.

34. (Previously Added) The apparatus of claim 26 wherein the cross sectional shape of the base surface of a bluff body has a perimeter shape other than a rectangle, and further comprising:

said boattail plates shaped with the perimeter of said base surface but at a smaller size, while maintaining the same predetermined inset distance from the edges of said bluff body and a similarly shaped rear edge for said boattail plates located to intercept the separated shear surfaces of said fluid flow at an outer perimeter of the low pressure wake.

35. (Previously Added) Apparatus for reducing to a minimum the fluid-dynamic base drag of a bluff body moving through a fluid passing generally along said bluff body and creating, at the rear of the body, separated shear surfaces which define a low pressure wake having an outer wake perimeter, which bluff body has a substantially flat rear base surface with given height and width dimensions and a periphery of trailing edges, said apparatus comprising:

vortex generator means mounted adjacent to and forward of said trailing edges for generating counter-rotating stream-wise vortices in said fluid layer, which generators cause the separated shear surfaces to turned sharply inward thereby reducing the size of the low pressure wake, and

edge means coupled to said base surface and inset from said trailing edges for intercepting said separated shear surfaces at the outer perimeter of said low pressure wake, namely, at a distance behind said base surface of about  $1/6$ th to  $1/8$ th of said given height or width dimension, whichever is les

## REMARKS

The Office Action may be characterized as follows:

1. Original Claims 5 through 10 and 13 have been cancelled. Claims 1 through 4, 11, 12, and 14 through 18 have incorrectly - by Mr. Patel - been indicated as withdrawn pending allowance of a generic claim. New claim 30 submitted by the last amendment is a dependent apparatus claim relating back to apparatus claim 27. Claim 30 should not be grouped with the asserted "withdrawn claims".

2. Claims 26 through 29 and 31 through 35 were rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as invention.

3. Claims 26 through 29 and 31 through 35 were rejected under 35 USC §103(a) as being unpatentable over Switlik '059 in view of Wheeler '837.

4. Claims 26 and 27 were questioned. The Examiner asserted that:

It is not clear between claim 26 and claim 27 whether applicant is claiming three or four boattails. (Emphasis Added.)

The above-noted bases for the rejection and/or objections are respectfully traversed.

Basford first discloses that fluid dynamic base drag is greatly reduced by his non-obvious aerodynamic features based upon a combination of vortex generators and shortened boattail plates not suggested in any known art.

Taking first the last rejection (summarized as number 4, above). Applicant has never claimed boattails. The Examiner's question refers to the number of "boattails" of claims 26 and 27. It is highly instructive that Examiner Patel still fails to

appreciate the difference between "boattails" and "boattail plates" as described and claimed by Basford.

Mr. Basford clearly specified the distinct differences between Boattails and Boattail Plates in his specification and original claims. (Mr. Basford's original claims 5 through 18 claimed "boattail plates".) Headings in the specification were provided by Mr. Basford in order to assist the reader. Thus, Mr. Basford has a heading entitled Boattails commencing at page 7, line 1, and clearly describes them and their drawbacks continuing unto page 8, line 20.

It is there stated in part under Full Boattails:

Therefore the primary drawback of full boattails is that the maximum drag reduction requires extreme length, often three to four times the width of the bluff body, making full boattails impractical for highway vehicles.

x x x x

[F]ull boattails terminating in a point or narrow edge are rarely used.

At another heading at page 9, line 23, Basford set forth Boattail Plates and devotes over two pages to the development of such structure. The two categories of methods and devices are simply not the same. Mr. Patel is either seriously mistaken or has simply glossed over the technology for reasons known only to him. In either event the Applicant is being harmed.

At this point Mr. Basford - who wrote his own application, and has been in repeated telephone contact with Examiner Patel - has lost faith in the Examiner's capabilities and requests that the Final Rejection be removed and the case transferred to a new Examiner who has familiarity with the aerodynamic factors relating to vortex generators, boattail plates and trailing panels for fluid drag



reduction. To that end another Second Declaration by Mr. Basford is being submitted herewith.

Additionally, claims 26 and 27 are set out below with emphasis added by underlining. Note that claim 26 is a generalized claim for a bluff body moving in a fluid; and, as such specifically states "four boattail plates". Claim 27, being more specific, refers to a land vehicle moving in air with "only three boattail plates". Nothing can be clearer or more specific than these numbers. Claim 26 uses "four" whereas claim 27 uses "three". What part of four (claim 26) or three (claim 27) can be unclear?

Mr. Basford's enclosed Second Declaration sets forth the technical and legal basis for removal of Examiner Patel from further examination of this case. Because he was prosecuting his own Application, Mr. Basford took great care concerning the content of his telephone conferences with Examiner Patel. While it would unduly lengthen this amendment to review all of the current Second Declaration content, it is believed instructive to look at some of the pertinent material in Mr. Basford's enclosed Declaration. The enclosed Declaration is being presented under Rule 131 and relative to a Petition for a new Examination, change of Examiners and removal of the Final Rejection which both Attorney Stan Jones and Mr. Basford believe has been done prematurely and without sufficient consideration.

Mr. Basford states under oath, in part, as follows:

... Examiner Patel apparently has little or no working knowledge of patent practice and case law regarding so called combination patents. During his first phone call to the applicant during the summer of 2002, Examiner Patel clearly stated that a patent could not be allowed if either of the component methods or devices for base drag reduction was previously known. In a second phone call the next day he stated that one of the component methods or devices could be previously known but that the other must be new. Later, he stated that both of the components could be previously known, but that at least one must be changed in some way.

Because of the apparent simplicity of my invention, I had previously researched this issue of combination patents to make sure that I had a patentable invention, before spending the time to prepare two Provisional Patent Applications and a Regular Patent Application for this invention. Therefore, I immediately recognized that all three of Examiner Patel's statements were contradicted by descriptions of combination patents in other readily available sources, and that that each of his three statements conflicted with the other two.

For example, in the book "Patent it Yourself" by David Pressman (Nolo.com, Seventh Edition, February 2000), on page 5-18, at the bottom of column one, under the heading "Secondary Factors in Determining Unobviousness of Combination Inventions" we find the following statement:

Inventions that combine two or more elements known in the prior art can still be held patentable, provided that the combination can be considered unobvious - that is, it's a new combination and it produces new and unexpected results.

The author then went on for another two full pages to discuss nine secondary factors in determining non-obviousness.

In another example, a quick internet search on Google turned up the following statement on the web site of IP attorneys Bowie and Jensen, LLC, of Towson, MD.

A combination patent is an invention that uses two or more previously well known elements and combines them to form a new product or device.

(Please see "<http://www.bowie-jensen.com/>")

In still another example, on another web site we find the statement:

The Supreme Court has used the term 'combination patent' to describe a patent for an invention whose novelty lies in a new combination of known elements. Thus, it is the interrelationship of the known components that is the subject of the patent.

(Please see "<http://www.biojudiciary.org/subpage1.asp?tid=158>")

Furthermore, although Examiner Patel's three statements clearly conflicted with each other, at no time did he acknowledge the differences between his three statements, or even acknowledge that he had made the prior contradictory statements. Therefore, unless we assume that Examiner Patel deliberately made false statements to an

applicant, we are forced to conclude that he lacks sufficient working knowledge of patent practice and case law on combination patents, and is therefore unqualified to examine an application for a combination patent.

3. Because the patentability of the subject invention depends on the definition of a combination patent, this issue alone is sufficient to cause the applicant to lose all confidence in the examiner; but there are more issues and reasons why the Examiner should be changed for an impartial review of my invention. I must conclude that Examiner Patel apparently has little or no working knowledge in the field of the Aerodynamics of Bluff Bodies, and moreover, find that he is unfamiliar with the standard terminology used in this field of art.

In the office actions received from Examiner Patel, he has made several statements which reveal beyond any doubt, that he has little or no knowledge of aerodynamics. For example, in his second Office Action of Sept. 24, 2002, starting on the fifth line from the bottom on page 7, he made the statement:

It is not clear what is claimed as invention because elected Fig. 8 contains a truck body not a bluff body. The truck body has six (sides) flat base surfaces not one.

However, anyone familiar with this art would surely know that a truck body is a bluff body, and that, in terms of aerodynamics, the base surface is always the rearmost surface of the bluff body. In the field of aerodynamics, a bluff body is, by definition, any body where the pressure drag, which includes both forebody drag and afterbody or base drag, is greater than the skin friction drag. By this definition all common highway trucks of the type shown in my specification are bluff bodies.

In a second example, in the second office action, Examiner Patel stated on page 7 that claims 5-18 were rejected as being indefinite, and provided many underlined examples over the next three pages of terminology that he considered vague or indefinite.

But after I hired a patent attorney and with the attorney's help, wrote all new claims, claims 19 through 35, the examiner again stated in the third Office Action that the claims were indefinite. At this point it became evident that the claims are not vague or indefinite, and that the main problem is instead that the examiner is simply not conversant with the standard technical terminology used in the field of the Aerodynamics of Bluff Bodies. Terms such as base drag, base surface, boundary layer, trailing edge, separated shear surface, and

low pressure wake, all have specific meanings that are well recognized, well understood and commonly used by all artisans working in the field of aerodynamic drag reduction.

The claims were carefully written using this standard technical terminology in order to clearly, concisely and unambiguously describe the invention to people of ordinary skill in this art field. In addition, please note that the invention is described in simpler language, for the benefit of persons less familiar with the technical language, in both the brief summary and abstract of the invention.

In a third example, Examiner Patel provided further evidence of his lack of knowledge of aerodynamics during one telephone call in the summer of 2002, when he stated that the patent application should be written so that it could be easily understood by a typical welder. However, the invention does not disclose any advances in the field of welding, and all the parts of the current invention can easily be made without requiring any welding.

Only later did it become apparent that the examiner wanted the invention described in very simple terms, terms that could be understood by a typical high school graduate with no knowledge of aerodynamics, apparently because the examiner himself did not recognize or understand the standard terminology routinely used in the field of aerodynamics.

4. Compounding his lack of knowledge of aerodynamics, Examiner Patel has failed to make use of the technical information provided in the application itself and the technical references submitted with the Invention Disclosure Statement ("IDS"). Applicant went to great lengths to provide the background information needed for readers to understand the application, both in the application itself and the various references that were explained in the specification.

x                      x                      x

Also, please note that my referenced citation 11 in the IDS refers to complete chapters from the book "Fluid-dynamic Drag" by Sighard Hoerner, which book is still considered by many to be the definitive work on aerodynamic drag, including Chapter 2 on boundary layers, Chapter 3 on pressure drag, including base drag, and Chapter 12 which deals specifically with the aerodynamics of land vehicles. However, Examiner Patel has failed to make use of any of these resources or he would not be asking the questions he has asked.

Because Examiner Patel has insufficient knowledge of the field, and has not made use of the technical information provided by the applicant, it is my opinion that he is unqualified to examine the subject application.

5. Examiner Patel has apparently not made a good faith effort to understand the invention, or comprehend the entire Regular Patent Application of June 8, 2001, applicant's Declaration of March 19, 2003, or the amendment dated 20 March 2003. Only one example need be set forth to illustrate this point.

Near the middle of page 4 in the most recent Office Action of May 27, 2003, Examiner Patel stated:

It is not clear between claim 26 and claim 27 whether applicant is claiming three or four boattails. (Emphasis Added.)

First, please note that Examiner Patel should be using the term "boattail plates" instead of boattails. The two structurally and functionally are much different and the two should not be confused. Second, claim 26 says that four boattail plates are to be used on a bluff body fully immersed in a fluid, while claim 27 says that only three boattail plates are needed on a land vehicle. How could this be made any clearer? It therefore, appears that either Examiner Patel has not read the claims carefully, or does not understand the differences or, perhaps, he is being deliberately difficult and disagreeable.

A second example: Please see the examiner's statement on page 11 in the second Office Action of Sept. 24, 2002, where it is stated that "Claims 5-10, 13, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Switlik '059, in view of Wheeler '837."

In response, applicant prepared a declaration which pointed out, among other things, that the boattail plates shown in Figs 1-17 of Switlik '059, clearly fall within the scope of Bilanin '808, and that the only new material claimed in Switlik '059 deals with the manner of folding the boattail plates to make them easier to use.

Nevertheless, in the most recent Office Action of 27 May 2003, Examiner Patel repeats almost word for word his previous rejection, changing only the claim numbers, with the statement; "Claims 26-29, 31-35, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Switlik '059 in view of Wheeler '837."

This obvious word-by-word repetition by Examiner Patel suggests that he has never read applicant's first Declaration of 19 March 2003 which was carefully written, clearly and concisely, to respond to the examiner's mistake in the previous Office Action of Sept. 24, 2002.

6. In his rejection under obviousness, on page 4 of the recent Office Action of May 27, 2003, it appears that Examiner Patel still does not understand the goals and objectives of this invention and of other related disclosures of the prior art.

In his rejection, Examiner Patel stated:

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device, as disclosed by Switlik '059, to include a plurality of vortex generators, as disclosed by Wheeler '837, to achieve the desire level of base drag reduction for the bluff body." (Emphasis Added)

For all inventions intended to reduce the base drag of bluff bodies, including highway vehicles, the desired level of base drag reduction is obviously the maximum possible base drag reduction within legal limitations and other practical constraints such as cost and ease of use. Since the subject invention provides roughly 50% greater base drag reduction than either Bilanin's boattail plates or Wheeler's low drag vortex generators when used alone, while simultaneously reducing the optimum length of the boattail plates by roughly half, it would be obvious to anyone with ordinary skill in the art, that Bilanin, Switlik, or Wheeler, or more probably all three, would have disclosed and claimed this combination in their patent applications, if they had been aware of its far greater benefits. Moreover, if they already knew, or even had any suspicion, that their invention could be used in combination with another known invention to produce far greater benefits, they would have been foolish to not disclose it and claim it.

Furthermore, standard patent practice requires full disclosure by every applicant, so applicants are not allowed to conceal known combinations which would provide greater base drag reduction at lower cost. No such disclosure, claim or suggestion is made in this art.

Since Examiner Patel does not understand the goals or significance of the subject invention, and has ignored attempts by the applicant to clarify these issues, he is unqualified to examine the subject application. Additionally, he refuses to acknowledge or admit

the clear inadequacies of the art that he relies upon in repeating his rejections.

7. Examiner Patel has been very difficult to work with, both to the applicant and to the applicant's patent attorney. For example, because of Examiner Patel's incorrect statements about combination patents, as described in section one above, which changed from one day to the next, the applicant concluded that all further communications should be in writing so that they would be well documented.

In a second example, during one of Examiner Patel's phone calls to the applicant in the summer of 2002, he pressed the applicant to hire a patent attorney, and to send in a complete amendment the very next day, which is clearly unreasonable.

In a third example, in each and every phone call, the examiner has stressed how little time he has for examining applications, and has implied that he was doing the applicant a great favor by looking at the application at all. This attitude is unacceptable. As an applicant, I have described and claimed my invention in as clear and concise terms as possible. Moreover, consistent with the requirement for full disclosure, I have provided information on the most relevant prior art, and all the needed technical background information. And I have paid all the required fees. In return, the examiner should make a good faith effort to fully understand and examine the application.

Claims 26 through 29 and 31 through 35 were rejected based upon an unfounded assertion that they are "indefinite" coupled with the Examiner's challenge to certain quoted phrases used in the claims. Examiner Patel concludes that the claim language used "has failed to particularly point out and distinctly claim the subject matter which applicant regards as the invention." Not so. In Mr. Basford's earlier Declaration dated March 29, 2003 he carefully explained his invention and also defined the terms used to define the novel features of his invention.

The problem may well be that the Examiner is simply unfamiliar with the technical terminology commonly used in the field of aerodynamic drag reduction. For example, terms such as base drag, base surface, boundary layer, trailing edge, separated shear surface, and low pressure wake, all have specific meanings that are well recognized, clearly understood and commonly used by all artisans working in

the field of aerodynamic drag reduction. This combination invention is clearly defined by careful use of such accepted terminology. These facts notwithstanding, Mr. Patel has ignored Mr. Basford's first Declaration and fails even to acknowledge that such a Declaration was submitted.

Not only that, but Mr. Patel has missed the most pertinent art which Mr. Basford has cited and explained at length. Perhaps the closest art relates to apparatus tested by W. A. Mair of Cambridge University, who considered vortex generators in conjunction with full or truncated boattails -- *not shortened boattail plates as claimed by Basford.* Mair concluded, without testing, that such a combination provided little or no additional drag reduction over the best boattail shapes when used alone. (Please see paragraphs 12 and 16 of the Basford Declaration dated March 19, 2003.) Thus the closest art is neither cited by the Examiner nor mentioned in his Action. Such art clearly teaches away from the invention and is highly probative evidence of the strength and power of the Basford discovery.

In clear contrast to Mair and the other art, Basford teaches moving the rearward edge of shortened boattail plates roughly 50% closer to the rear of the truck. Such a simple step -- by hindsight -- provides both novel and commercially viable savings. Basford's unique edge location (whether boattail plates or a trailing panel of generic claim 35) works to reduce drag whereas the prior art has failed. The Basford structure thus satisfies several significant criteria for a patentable invention.

As a further aid to the Examiner's understanding, please note that Figure 1 of the Basford Application must be taken in consideration with Basford Figure 8. Figure 1 is a schematic plan view of the rear end of a bluff body 20, with an arrow 21 showing the direction of fluid flow. Such flow includes boundary layers 23 which form along the side surfaces 22, and become the separated shear surfaces 26 after passing the trailing edges 24 of the truck body. The flow pattern includes the recirculation bubble - also known as a low pressure wake - which forms behind the base surface 25. Vortex generator arrays 40, cause the separated shear surfaces 26 to turn sharply inward thereby reducing the size of the low pressure wake. Placing a rear edge of the boattail plates 50B (Basford Figure 8) at the outer perimeter of the low pressure wake, provides maximum fluid-dynamic base drag



reduction for the truck body 30. This stated positioning of the rear edge in combination with vortex generators is critical to the Basford invention and is nowhere taught or suggested by the prior art. (Please see paragraphs 7 through 9, 12 and 16 of the first Basford Declaration.)

The above-noted accepted terminology and elements from Basford Figures 1 and 8 will now be applied to, for example, claims 26 and 27 by associating the element numbers from the Basford drawing with the claim terminology.

26. Apparatus for reducing the fluid-dynamic base drag of a bluff body (20) moving through a fluid (21) and creating, at the rear of the body, a low pressure wake having an outer wake perimeter, which bluff body (20) has a substantially flat rear base surface (25), a pair of opposed side surfaces (22A and 22B), and opposed top and bottom surfaces all joined with said rear base surface at side, top and bottom trailing edges (24), respectively, so as to form a box-like container (30), said apparatus comprising:

means positioning side-by-side vortex generators in a linear array (40) ahead of the two side, top and bottom trailing edges (24) of said bluff body (20) for generating counter rotating stream-wise vortices (shown in Figs. 2 and 3 of Wheeler '837) in a fluid boundary layer (23) passing generally along said bluff body and creating from said layer separated shear surfaces (26) which turn sharply inward aft of said trailing edges (24);

four boattail plates (50) inset and affixed a predetermined distance from the top and side trailing edges; and

rear edges on said boattail plates (50) sized to intercept the separated shear surfaces (26) [of said fluid layer] at the outer perimeter of the low pressure wake, thereby providing maximum fluid-dynamic base drag reduction for said body. (Emphasis added.)

27. The apparatus in accordance with claim 26 wherein the bluff body is a land vehicle moving in air, which vehicle has only three boattail plates attached adjacent the top and opposed side trailing edges; and

three linear arrays of vortex generators, one array each associated with one each of said boattail plates. (Emphasis added.)

Mr. Basford has thus discovered that vortex generators, ala the Wheeler disclosure, cause the separated shear surfaces (elements 26, above) to sharply

swing inward just aft of the trailing edges 24 of the bluff body. Basford combines known linear vortex arrays with boattail plates having rear edges placed so as to intercept those separated shear surfaces at the outer perimeter of the inwardly-turned (and smaller) low pressure wake. The location and positioning of these rear edges is much closer to the base surface of the trailer body than Bilanin, or Switlik or any other known art teaches or suggests.

Combining vortex generators and boattail plates is novel over the art. With a truck body moving in air (Claim 27), maximum base drag reduction is achieved when the rear edges of the three shortened boattail plates are positioned in a rearward direction at about 1/6th the width of the truck's rear surface. (Please see Claims 23, 24, and generic claim 35 which set forth that novel dimensional relationship in varying terminology.

Of course - contrary to what Examiner Patel acknowledges - claim 35 is generic to all embodiments of the Basford invention. Likewise, Examiner Patel is flatly wrong when he refuses to allow claims to both method (Claims 19, 20 and 21 - 25) and apparatus (Claims 26 through 35) covering the same Basford embodiment in this one patent application. Reconsideration is respectfully requested. A Notice of Appeal and Formal Petition will, if necessary, be filed on this particular issue among other issues as required.

The art relied upon by the Examiner is Switlik '059 in combination with Wheeler '837. What is lacking in such art is the precise combination of linear arrays of vortex generators in combination with boattail plates, as claimed. Moreover the critical rearward extension length of about 1/6 the width of the base surface (assuming width less than height, as usually is the case) is not suggested by such an art combination. Inventor Basford defines the size of his shortened boattail plates so that the rear edges of such plates intercept the separated shear surfaces at the outer perimeter of the low pressure wake. This novel, and heretofore unknown combination, provides maximum fluid-dynamic base drag reduction for a bluff body. That novel combination constitutes the crux of the Basford invention. One wonders if these aerodynamic improvements can be presented in any clearer terminology. Reconsideration is requested.

It is readily apparent simply from the Switlik patent drawings, that Switlik discloses full length boattail plates as first taught by the Bilanin '808 patent. Please note that Figures 1 and 2 of the Switlik patent show a dimension for the plates 28, 32 of about 36 inches or so. See paragraph 14 of the Basford Declaration. Also it should be noted that Switlik, at column 9, lines 31 through 47, discloses the Bilanin panels, but points his invention in the direction of ease of deployment of such panels. Please see, column 10, lines 34 through 54, etc. Nowhere does Switlik teach or suggest using shortened boattail plates of an extension length of about 12 to 18 inches on a full sized truck body or 1/8th to 1/6 the width of the base surface, as claimed by Basford.

In short summary, what has not been recognized before this novel invention, was that combining the two techniques - vortex generators and shortened boattail plates - would greatly improve base drag reduction provided that the extension length (ie. plate width, per se) of the boattail plates was about 1/6 of the width of the base surface.

Using the truck examples of the specification, the outside width of the rear base surface is about 102 inches, and the inventive 1/6 of 102 inches is about 18 inches. (It is 1/8th, or about 12 inches in Basford Fig. 9, in order to comply with the Department Of Transportation Regulations for trailers built after January, 1998). This Basford improvement is a far cry from the 36 to 40 inches of the prior art, including Bilanin, Switlik and the other references. The Basford invention is clearly novel over such art.

Note that this critical "1/6th the base width feature" (or "1/8th" in Basford Fig. 9) is clearly specified in some of the claims. The first Basford Declaration further sets forth ample reason why the prior art teaches away from this claimed distinction. In particular, the Basford Declaration confirms that independent Claims 19, 20, 26 and 35, for example, define a novel combination over all of the known and cited art.

Likewise, Claim 35 is a generic claim that is clearly allowable over the known art. It reads as follows:

-- 35. Apparatus for reducing to a minimum the fluid-dynamic base drag of a bluff body moving through a fluid passing generally along said bluff body

and creating, at the rear of the body, separated shear surfaces which define a low pressure wake having an outer wake perimeter, which bluff body has a substantially flat rear base surface with given height and width dimensions and a periphery of trailing edges, said apparatus comprising:

vortex generator means mounted adjacent to and forward of said trailing edges for generating counter-rotating stream-wise vortices in said fluid layer, which generators cause the separated shear surfaces to turned sharply inward thereby reducing the size of the low pressure wake, and

edge means coupled to said base surface and inset from said trailing edges for intercepting said separated shear surfaces at the outer perimeter of said low pressure wake, namely, at a distance behind said base surface of about 1/6th to 1/8th of said given height or width dimension, whichever is less. --.

As conceded by the Examiner, the Switlik reference is completely devoid of the Basford vortex generators for creating a smaller low pressure wake, which enables the separated shear surfaces to intercept the rear edges of the shortened boattail plates at a distance of only about 1/6 to 1/8 of the base surface width. Furthermore, nothing in Switlik or Wheeler suggests such a combination.

Only after reading and understanding the Basford specification did the Examiner piece together two non-related patents for his obviousness rejection. What the Examiner has done is use Applicant's own specification against him to his great detriment. That is wholly unfair. Reconsideration is respectfully requested.

The earlier Basford Declaration clearly explains these novel principles in carefully worded terminology defining a new and non-obvious solution to a problem which all prior artisans overlooked. If it were so readily obvious - as the Examiner contends - why is it not shown or suggested by the cited art? Instead, the cited art - Applicant respectfully submits - testifies to the worthiness, merit and novelty of the Basford invention. It clearly does not - as the Examiner contends - negate the claimed novelty.

This amendment is being timely presented within two months immediately following the final rejection. This case is believed to be in condition for passage to the Issuance Branch and such action is requested. Otherwise - should the case be determined not allowable - Applicant and the undersigned hereby request a telephonic interview with Examiner Patel and his supervisor, Mr. Glenn Dayoan

(703) 308 - 3102. The undersigned will call Examiner Patel shortly in order to determine the status of this Application.

If necessary, a Notice of Appeal will be filed, and that Notice will be followed by a formal petition to Remove Examiner Patel from further prosecution in this matter. In any event, this Amendment must be entered to reduce the number of issues on Appeal and to sharpen the clarity of understanding relative to any Formal Petition that may become necessary.

Respectfully submitted,

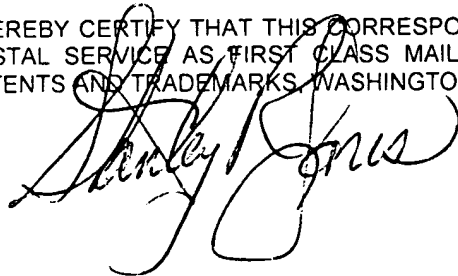
  
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I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO: COMMISSIONER OF PATENTS AND TRADEMARKS, WASHINGTON, D.C. 20231, ON July 26, 2003 (DATE OF DEPOSIT).  
BY:  (REG. REP.)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Basford, William C.	)	Patent Examiner:
	)	Patel, Kiran B.
Filing Date: June 8, 2001	)	
	)	ART UNIT: 3612
Serial No.: 09/877,585	)	
	)	
For:	)	
	)	25
	)	July 25, 2003
<b>AERODYNAMIC COMBINATION FOR</b>	)	
<b>IMPROVED BASE DRAG REDUCTION</b>	)	
(Amended)	)	Hallowell, Maine
-----	)	Zip: 04347

DECLARATION UNDER 37 CFR SECTION 1.132

Honorable Commissioner of  
Patents and Trademarks  
Washington, D.D. 20231

Dear Sir:

William Basford, being duly sworn testifies and states as follows:

1. This declaration is provided to support the patentability of my invention, together with providing support for a change of examiners for my Utility Patent Application identified above and currently assigned to Examiner Kiran Patel. I hereby acknowledge and reaffirm the contents of my earlier Declaration signed on March 29, 2003. In my earlier Declaration I set forth my Engineering expertise, work experience, background development and novelty and unexpected advantages of my invention over the known and cited art.

In this Declaration I refer to myself as the applicant and I hereinafter list six reasons why Examiner Patel is unqualified to examine the subject utility patent application.

2. It is my considered opinion that Examiner Patel apparently has little or no working knowledge of patent practice and case law regarding so called combination patents. During his first phone call to the applicant during the summer of 2002, Examiner Patel clearly stated that a patent could not be allowed if either of

the component methods or devices for base drag reduction was previously known. In a second phone call the next day he stated that one of the component methods or devices could be previously known but that the other must be new. Later, he stated that both of the components could be previously known, but that at least one must be changed in some way.

Because of the apparent simplicity of my invention, I had previously researched this issue of combination patents to make sure that I had a patentable invention, before spending the time to prepare two Provisional Patent Applications and a Regular Patent Application for this invention. Therefore, I immediately recognized that all three of Examiner Patel's statements were contradicted by descriptions of combination patents in other readily available sources, and that that each of his three statements conflicted with the other two.

For example, in the book "Patent it Yourself" by David Pressman (Nolo.com, Seventh Edition, February 2000), on page 5-18, at the bottom of column one, under the heading "Secondary Factors in Determining Unobviousness of Combination Inventions" we find the following statement:

Inventions that combine two or more elements known in the prior art can still be held patentable, provided that the combination can be considered unobvious - that is, it's a new combination and it produces new and unexpected results.

The author then went on for another two full pages to discuss nine secondary factors in determining non-obviousness.

In another example, a quick internet search on Google turned up the following statement on the web site of IP attorneys Bowie and Jensen, LLC, of Towson, MD.

A combination patent is an invention that uses two or more previously well known elements and combines them to form a new product or device.

(Please see "<http://www.bowie-jensen.com/>")

In still another example, on another web site we find the statement:

The Supreme Court has used the term 'combination patent' to describe a patent for an invention whose novelty lies in a new combination of known elements. Thus, it is the interrelationship of the known components that is the subject of the patent.

(Please see "<http://www.biojudiciary.org/subpage1.asp?tid=158>")

Furthermore, although Examiner Patel's three statements clearly conflicted with each other, at no time did he acknowledge the differences between his three statements, or even acknowledge that he had made the prior contradictory statements.

Therefore, unless we assume that Examiner Patel deliberately made false statements to an applicant, we are forced to conclude that he lacks sufficient working knowledge of patent practice and case law on combination patents, and is therefore unqualified to examine an application for a combination patent.

3. Because the patentability of the subject invention depends on the definition of a combination patent, this issue alone is sufficient to cause the applicant to lose all confidence in the examiner; but there are more issues and reasons why the Examiner should be changed for an impartial review of my invention. I must conclude that Examiner Patel apparently has little or no working knowledge in the field of the Aerodynamics of Bluff Bodies, and moreover, find that he is unfamiliar with the standard terminology used in this field of art.

In the office actions received from Examiner Patel, he has made several statements which reveal beyond any doubt, that he has little or no knowledge of aerodynamics. For example, in his second Office Action of Sept. 24, 2002, starting on the fifth line from the bottom on page 7, he made the statement:

It is not clear what is claimed as invention because elected Fig. 8 contains a truck body not a bluff body. The truck body has six (sides) flat base surfaces not one.

However, anyone familiar with this art would surely know that a truck body is a bluff body, and that, in terms of aerodynamics, the base surface is always the rearmost surface of the bluff body. In the field of aerodynamics, a bluff body is, by definition, any body where the pressure drag, which includes both forebody drag and afterbody or base drag, is greater than the skin friction drag. By this definition all common highway trucks of the type shown in my specification are bluff bodies.

In a second example, in the second office action, Examiner Patel stated on page 7 that claims 5-18 were rejected as being indefinite, and provided many underlined examples over the next three pages of terminology that he considered vague or indefinite.

But after I hired a patent attorney and with the attorney's help, wrote all new claims, claims 19 through 35, the examiner again stated in the third Office Action that the claims were indefinite. At this point it became evident that the claims are not vague or indefinite, and that the main problem is instead that the examiner is simply not conversant with the standard technical terminology used in the field of the Aerodynamics of Bluff Bodies. Terms such as base drag, base surface, boundary layer, trailing edge, separated shear surface, and low pressure wake, all have specific meanings that are well recognized, well understood and commonly used by all artisans working in the field of aerodynamic drag reduction.

The claims were carefully written using this standard technical terminology in order to clearly, concisely and unambiguously describe the invention to people of ordinary skill in this art field. In addition, please note that the invention is described in



simpler language, for the benefit of persons less familiar with the technical language, in both the brief summary and abstract of the invention.

In a third example, Examiner Patel provided further evidence of his lack of knowledge of aerodynamics during one telephone call in the summer of 2002, when he stated that the patent application should be written so that it could be easily understood by a typical welder. However, the invention does not disclose any advances in the field of welding, and all the parts of the current invention can easily be made without requiring any welding.

Only later did it become apparent that the examiner wanted the invention described in very simple terms, terms that could be understood by a typical high school graduate with no knowledge of aerodynamics, apparently because the examiner himself did not recognize or understand the standard terminology routinely used in the field of aerodynamics.

4. Compounding his lack of knowledge of aerodynamics, Examiner Patel has failed to make use of the technical information provided in the application itself and the technical references submitted with the Invention Disclosure Statement ("IDS"). Applicant went to great lengths to provide the background information needed for readers to understand the application, both in the application itself and the various references that were explained in the specification. Note for example, that pages 3 through 5 of the original application provide brief descriptions of several of the most relevant technical principles, including the "jet pump mechanism" which causes base drag, "Hoerner's Law", and the "low pressure wake". Furthermore, Fig. 1 in my drawing was provided to help describe how base drag is created, how fluid flow pattern results in a large recirculation bubble on the base surface, and that Figure 1 also identifies the boundary layers 23, the trailing edges 24, the base surface 25, the separated shear surfaces 26, all of which define the limits of the low pressure wake, etc.

Also, please note that my referenced citation 11 in the IDS refers to complete chapters from the book "Fluid-dynamic Drag" by Sighard Hoerner, which book is still considered by many to be the definitive work on aerodynamic drag, including Chapter 2 on boundary layers, Chapter 3 on pressure drag, including base drag, and chapter 12 which deals specifically with the aerodynamics of land vehicles. However, Examiner Patel has failed to make use of any of these resources or he would not be asking the questions he has asked.

Because Examiner Patel has insufficient knowledge of the field, and has not made use of the technical information provided by the applicant, it is my opinion that he is unqualified to examine the subject application.

5. Examiner Patel has apparently not made a good faith effort to understand the invention, or comprehend the entire Regular Patent Application of June 8, 2001, applicant's Declaration of March 19, 2003, or the amendment dated 20 March 2003. Only one example need be set forth to illustrate this point.

Near the middle of page 4 in the most recent Office Action of May 27, 2003, Examiner Patel stated:

It is not clear between claim 26 and claim 27 whether applicant is claiming three or four boattails. (Emphasis Added.)

First, please note that Examiner Patel should be using the term "boattail plates" instead of boattails. The two structurally and functionally are much different and the two should not be confused. Second, claim 26 says that four boattail plates are to be used on a bluff body fully immersed in a fluid, while claim 27 says that only three boattail plates are needed on a land vehicle. How could this be made any clearer? It therefore, appears that either Examiner Patel has not read the claims carefully, or does not understand the differences or, perhaps, he is being deliberately difficult and disagreeable.

A second example: Please see the examiner's statement on page 11 in the second Office Action of Sept. 24, 2002, where it is stated that "Claims 5-10, 13, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Switlik '059, in view of Wheeler '837."

In response, applicant prepared a declaration which pointed out, among other things, that the boattail plates shown in Figs 1-17 of Switlik '059, clearly fall within the scope of Bilanin '808, and that the only new material claimed in Switlik '059 deals with the manner of folding the boattail plates to make them easier to use.

Nevertheless, in the most recent Office Action of 27 May 2003, Examiner Patel repeats almost word for word his previous rejection, changing only the claim numbers, with the statement; "Claims 26-29, 31-35, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Switlik '059 in view of Wheeler '837."

This obvious word-by-word repetition by Examiner Patel suggests that he has never read applicant's first Declaration of 19 March 2003 which was carefully written, clearly and concisely, to respond to the examiner's mistake in the previous Office Action of Sept. 24, 2002.

6. In his rejection under obviousness, on page 4 of the recent Office Action of May 27, 2003, it appears that Examiner Patel still does not understand the goals and objectives of this invention and of other related disclosures of the prior art.

In his rejection, Examiner Patel stated:

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device, as disclosed by Switlik '059, to include a plurality of vortex generators, as

appreciate the difference between "boattails" and "boattail plates" as described and claimed by Basford.

Mr. Basford clearly specified the distinct differences between Boattails and Boattail Plates in his specification and original claims. (Mr. Basford's original claims 5 through 18 claimed "boattail plates".) Headings in the specification were provided by Mr. Basford in order to assist the reader. Thus, Mr. Basford has a heading entitled Boattails commencing at page 7, line 1, and clearly describes them and their drawbacks continuing unto page 8, line 20.

It is there stated in part under Full Boattails:

Therefore the primary drawback of full boattails is that the maximum drag reduction requires extreme length, often three to four times the width of the bluff body, making full boattails impractical for highway vehicles.

x x x x

[F]ull boattails terminating in a point or narrow edge are rarely used.

At another heading at page 9, line 23, Basford set forth Boattail Plates and devotes over two pages to the development of such structure. The two categories of methods and devices are simply not the same. Mr. Patel is either seriously mistaken or has simply glossed over the technology for reasons known only to him. In either event the Applicant is being harmed.

At this point Mr. Basford - who wrote his own application, and has been in repeated telephone contact with Examiner Patel - has lost faith in the Examiner's capabilities and requests that the Final Rejection be removed and the case transferred to a new Examiner who has familiarity with the aerodynamic factors relating to vortex generators, boattail plates and trailing panels for fluid drag

8. In a fourth example, early one morning in April, 2003 several weeks after the amendment of 20 March 2003 was submitted, applicant received an irate phone call from Examiner Patel, who was clearly very displeased because he could not find the phone number for Attorney Jones in the first place he had looked for it. I provided the Attorney's phone number and the examiner later called Mr. Jones on the telephone. Nevertheless, Examiner Patel's most recent Office Action, dated May 27, 2003, was mailed by the examiner to the applicant at an old address, even though a Power of Attorney was included with the amendment/response prepared by attorney Stanley Jones on March 20, 2003. As a direct result, applicant did not receive the Office Action until Saturday, June 7, 2003, and applicant's attorney did not receive the Office Action until Tuesday, June 10, 2003, two weeks after it was mailed from the patent office.

9. In a fifth example, although the applicant prepared a Declaration that was submitted along with the response of 20 March 2003, Examiner Patel has not acknowledged receipt of this declaration, and apparently has not read it, even though the applicant spent several days making the declaration as clear and concise as possible, in an effort to help the examiner better understand the application.

I have now set forth my advances over the prior art in my applications - provisional and non-provisional, in my earlier Declaration and in the Amendment of 20 March 2003 and again herein in this Declaration together with the accompanying Amendment. I have repeatedly distinguished my invention from the prior art proposed in the Patel Office Actions.

10. Nowhere in such prior art combinations do I find any disclosure or suggestion that would normally lead one of ordinary skill in the drag reduction field to my invention. The combination proposed by the Examiner, in my opinion leads away rather than toward my invention. Even if - purely for the sake of argument and contrary to what the references suggest - the Switlik '059 and Wheeler '837 patents were combined as the Examiner suggests - the result is still not what I have advanced, taught and claimed as my invention. Indeed, my invention is for a combination that is nowhere taught or suggested by either reference whether taken alone or in combination.

11. All statements made herein of my own knowledge are true and all statements made on information and belief are believed to be true; and further, these statements are made with knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both or under §1001 of Title 18 of the United States Code and that such willful, false statements may jeopardize the validity of the application for any patent issuing thereon.

12. In view of the foregoing reasons, I urge that Examiner Patel must reconsider his bases for the rejection if he were to continue in an Examining capacity relative to my invention. I strongly urge, petition and request that Examiner Patel be relieved from further examination of this application. I feel strongly that Mr. Patel may have been adversely biased against my invention simply because I was originally

acting without the initial benefit of a Patent Attorney. Now that I have followed his recommendation and sought Patent Attorney assistance, Mr. Patel nevertheless refuses to reconsider his initial positions. My invention is patentable over the art and I have distinctly and clearly claimed what all of the known art fails to show, disclose or suggest.

13. I request that Mr. Patel's Supervisor, Mr. Glenn Dayoan, remove Mr. Patel from further examination efforts in my application. Additionally, I request a conference call between Messrs. Stan Jones, myself, Mr. Patel and Mr. Dayoan so that the premature "final rejection" may be removed and a new Examiner may be appointed. This Declaration is not being submitted for purposes of delay, but rather is made in good faith because I do not yet believe I have received a fair or impartial Examination relative to my invention.

Dated: July 25, 2003  
By: William C. Basford  
William C. Basford



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Basford, William C.	)	Patent Examiner:
	)	Patel, Kiran B.
Filing Date: June 8, 2001	)	
	)	ART UNIT: 3612
Serial No.: 09/877,585	)	
	)	
For:	)	
	)	November 25, 2003
<b>AERODYNAMIC COMBINATION FOR</b>	)	Hallowell, Maine
<b>IMPROVED BASE DRAG REDUCTION</b>	)	Zip: 04347
-----	)	

**PETITION TO THE COMMISSIONER UNDER 37 CFR 1.181 FOR  
RECONSIDERATION OF FINAL REJECTION UNDER 35 USC 112**

**INTRODUCTION**

This Petition is being filed in response to a telephonic instruction from Supervisory Examiner, Glen Dayoan (703) 308 - 3102 after his preliminary review of the record in this case. The petition is based upon the documents on file, 37 CFR 1.181 and in the alternative under MPEP Section 706.07 (Premature final rejection.)

**Brief Description of the Application**

The Application is directed to embodiments of aerodynamic configurations for attachments at the rear end of a truck body in order to reduce drag on the truck body. The invention reduces fuel consumption with a minimum of inconvenience to otherwise normal truck operation.

The Application was filed by the inventor Basford while living in New Hampshire and is based upon two earlier Provisional Applications.

At the time of Examination the Application included 13 Figures, 18 original claims, specification of almost 50 pages, 23 Non-patent references and 10 patent references. Examiner Patel then added another 29 patent citations in his first Office Action.

Applicant's Attorney located in Maine did not get involved until well after a series of telephone exchanges occurred between Applicant Basford and Examiner Patel, and a first Office Action, together with certain restriction requirements, had taken place. Even after the present Attorney made an appearance with a Maine address, Patent Office mail continued to go to Mr. Basford's earlier New Hampshire address. Mr. Basford was then living in Maine and all Patent Office mail should have been going to Maine.

Examiner Patel, in a "rush to rejection" became so fixated on a Second Action Final that he totally lost sight of the fact that the Inventor/Applicant was following the Examiner's suggestions in spite of a clash of personalities between the Examiner and the Applicant. For example, Applicant Basford sought out an Attorney to improve the form of the drawings, claims, specification and add generic claims - all as required/suggested by Examiner Patel.

The record will show that Examiner Patel - from a technology standpoint - was in over his head; but, nevertheless, refused to give an additional Office Action so that a clear issue for Appeal and/or Allowance purposes could be formulated. In that environment, a

practical common sense approach of working with the Applicant and his Attorney was overlooked.

The patentability issues could have been finely honed without undue delay or numerous repetitive Actions if Examiner Patel had resisted an immediate Final Rejection; or, if Examiner Patel had shown any willingness to aid the inventor/Applicant in his quest for an allowance.

Reconsideration is respectfully requested.

#### **Status of claims in case**

Claims 1 through 4, 11, 12 and 14 through 35 are pending, with claims 1 through 4, 11, 12, 14 through 25 and 30 being assertively withdrawn from consideration. Claims 26 through 29 and 31 through 35 stand finally rejected under both 35 USC 112 and 35 USC 103(a). (No petition is filed regarding the prior art 35 U.S.C. 103(a) rejection at this time.)

Claim 30 is dependent from examined claim 27 and thus is improperly listed as withdrawn. Claim 30 should be subject to examination along with the other claims. This petition seeks reconsideration of the final rejection under 35 USC 112 as being done without adequate consideration and/or as being premature.

#### **Background facts**

Briefly stated the record includes the following facts which show that the final rejection was both premature and based upon unsound considerations. Each factual event in a time line includes brief comments.



June 8, 2001

Applicant, Mr. William Basford, acting on his own and without the assistance of any patent attorney filed his own utility patent application. When Examination began, Mr. Basford had some telephone conferences with Examiner, Mr. Kiran B. Patel. Without benefit of counsel, Mr. Basford discussed his aerodynamic-related invention for conservation of fuel usage via novel positioning of certain attachments to the back of truck bodies.

Examiner Patel noted the absence of any generic claim covering two separate embodiments and telephonically divided the application by a Restriction Requirement. The telephone exchanges between Applicant Basford and Examiner Patel were neither fruitful nor pleasant. An atmosphere of hostility and distrust resulted when Examiner Patel kept giving Applicant incorrect information about the law regarding combination patents.

September 9, 2002

The first Office Action issued. It was primarily directed to procedural shortcomings regarding the form of the Application. The format of the specification was incorrect. Section headings defining the content of the specification were missing. Examiner Patel suggested to Mr. Basford that a Registered Patent Attorney should help in the prosecution.

Some of the comments by Examiner Patel - regarding a 35 USC 112 rejection of then pending claims 5 through 18 - reveal that Examiner Patel lacked technical competence in aerodynamics of fluid flow over bluff bodies.

March 20, 2003

The undersigned Patent Attorney filed a Power of Attorney and entered an appearance. An amendment was filed on March 20, 2003 revising the format of the specification, inserting proper headings and making changes to the claim terminology. Rewritten claims, including claims 19 through 35 were drafted with care to overcome the earlier 35 USC 112 complaints regarding the original claims.

According to Examiner Patel:

Claims 26 - 29, 31 - 35, as best understood are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. (Emphasis by Patel.)

To the contrary claims 26 through 29 and 31 through 35 are believed to be clear, definite and in proper form. As mentioned earlier claim 30 is dependent from claim 27 and thus must not be considered as withdrawn.

Mr. Basford submitted a Declaration under 35 CFR Section 1.132, and in 18 separate paragraphs requiring seven pages, set forth cogent reasons why the claimed invention was clearly defined and why it distinguished over the art.

In this unique situation, fairness and a balanced desire to deal justly with both the public and the Applicant, mandates that the first direct "PTO-to-Applicant" Action should not count toward an immediate Second Action Final. Additionally, after clearing up

terminology uncertainties, another Action on the merits would have allowed a clear issue to develop between the Patent Office and the Applicant. That never happened.

May 27, 2003

The first rejection was made final.

Examiner Patel refused any further consideration even though a clear issue between the parties had not yet been developed. To the extent that claim ambiguity may have been involved, no guidance was offered by Examiner Patel and no attempt was made to offer suggested changes. Indeed, the hasty and ill-considered final rejection left Applicant adrift without any comfort that Examiner Patel had really tried to understand the invention.

July 26, 2003

Within two months after Final rejection another detailed and thorough Amendment was filed. Reconsideration of the final rejection was requested to no avail.

That July amendment included another Declaration by Mr. Basford, detailing the trouble that he had encountered with Mr. Patel's lack of grounding in principles of aerodynamics and fluid flow. Applicant submitted a detailed second Declaration pointing out the lack of technical experience in the area of aerodynamics

and fluid flow as exhibited by Examiner Patel. Applicant requested that a new Examiner be appointed to replace Examiner Patel.

Neither the second Basford Declaration nor the Amendment of July 26, 2003 was entered.

August 26, 2003

A first Advisory Action was issued by an Acting Examiner Pedder in which Attorney Stanley R. Jones was referred to as Mr. Stone. No telephone conference, as requested, in the July Amendment ever took place, and PTO mail continued to go to a former New Hampshire Address for Mr. Basford.

In that Advisory Action the second Declaration by Applicant Basford was denied entry because it:

"...was found to be non persuasive because the Declaration lacks valid arguments against the art rejection."

The art rejection was discussed in the first Basford Declaration filed on March 19, 2003. That first Basford Declaration has yet to be mentioned by the PTO. It is as if it were never filed.

Admittedly, the second Basford Declaration does not discuss the art rejection. The second Basford Declaration was filed in order to point out the lack of competence of Examiner Patel, and to show that the invention has not yet received a full and complete examination.

October 17, 2003

The power of Attorney to the undersigned - submitted on March 27, 2003 was finally accepted. Mail, nevertheless, continued to go directly to Mr. Basford and telephone contact continued between Basford and Examiner Patel. Such further telephonic communication was not helpful.

October to Date

Mr. Patel's supervisor, Mr. Glen Dayoan, then informally reviewed the case file. This Petition for Reconsideration, under CFR 1.181 and limited to the 35 USC 112 issue, is filed pursuant to his suggestion and preliminary review.

## **ARGUMENT**

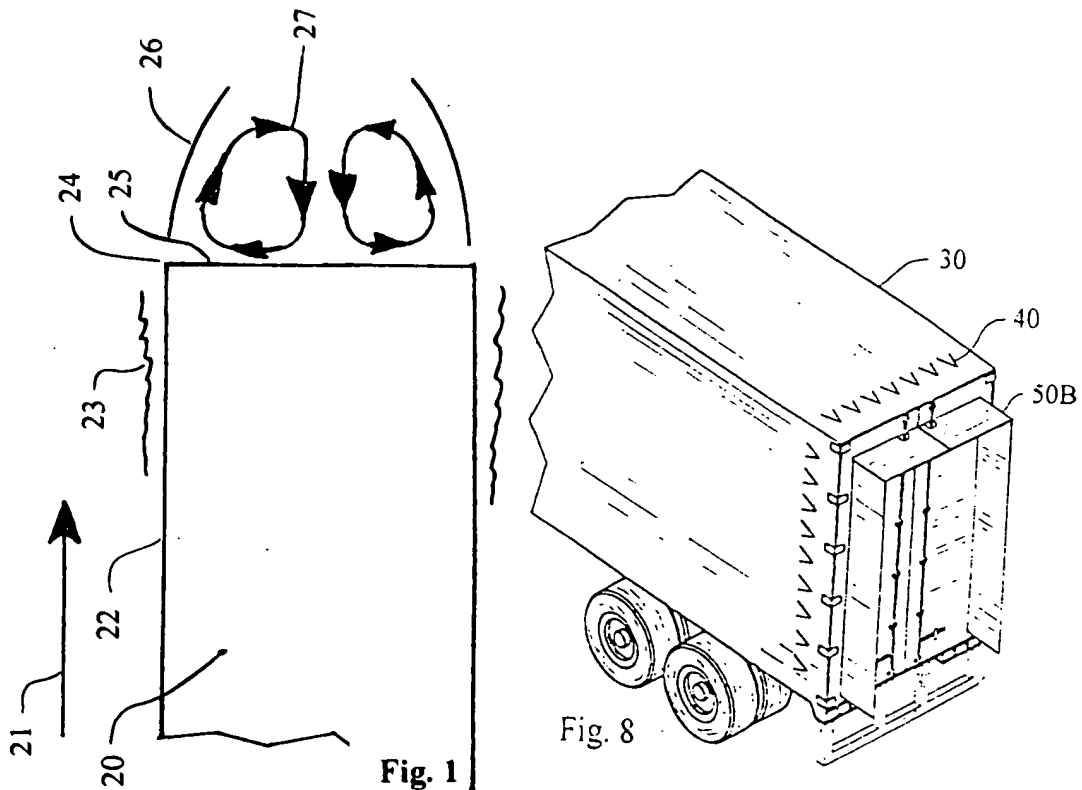
Applicant has not yet received an adequate examination of his invention. The invention is simple in concept and involves a combination of vortex generators and shortened boattail plates. These aerodynamic features greatly reduce fluid dynamic base drag.

Representative claims include claims 26 and 27. The examiner questioned the number of "boattails" of these claims and stated:

It is not clear whether applicant is claiming three or four boattails. (Emphasis Added.)

It is highly instructive that Examiner Patel fails to appreciate the difference between prior art "boattails" and "boattail plates" as described and claimed by Basford. Moreover, Examiner Patel never understood that shortened boattail plates were claimed with a new and unusual configuration and a highly significant result. The grounds for his rejection were not adequately developed since Examiner Patel has not yet addressed the difference between boattails and boattail plates.

Fig. 1 and Fig. 8 of the application are shown side by side below.



Mr. Basford clearly specified the distinct differences between Boattails and Boattail Plates in his specification and original claims. (Mr.

Basford's original claims 5 through 18 also claimed "boattail plates".) Headings in the specification were provided by Mr. Basford in order to assist the reader. There is a heading entitled Boattails commencing at page 7, line 1, and clearly describes them and their drawbacks continuing unto page 8, line 20.

It is there stated in part under Full Boattails that such boattails "terminating in a point or narrow edge" are rarely used.

[T]he primary drawback of full boattails is that the maximum drag reduction requires extreme length, often three to four times the width of the bluff body, making full boattails impractical for highway vehicles.

At another distinct heading at page 9, line 23, Basford sets forth boattail plates and devotes over two pages to the technological development of such structure. The two categories of methods and devices are simply not the same. Mr. Patel simply glossed over the technology. Applicant has been harmed by incomplete, premature and precipitous action in the Patent Office.

Claims 19 through 25 are method claims and several of those claims specifically address the size of the shortened boattail plates. The sizing step of dependent claim 23 relates the length of the boattail plates to claim 22's definition of a roadway truck body restricted to a two foot limit for a rearward extension of trailer underride bars (shown in Fig. 8 above.)

For a typical full sized 102 inch wide semi-trailer truck body trailer the length of the boattail plates is about 18 inches, or - as claim 23 states, in part.

about 1/6 the ..... of the width ..... of the rear base surface [of the semi-trailer's base or rear surface].

Claim 24 expresses that sizing step as boattail plates about 12 inches in length. In any event, the extension length for the boattail plates of the invention is under the 24 inch limit. These facts were ignored by the Examiner who never addressed these issues in his action. Because of the precipitous and premature final rejection these issues remain unresolved.

Claim 26 is an apparatus claim. Claim 26 is directed to a generalized bluff body in a fluid, while claim 27 is specific to a highway vehicle moving in air. In the non-entered amendment dated July 26, 2003 the elements of the Basford drawing were inserted in claim 26 as an aid for the Examiner's review. Thus, claim 26 was amended with those element numbers from Basford Figures 1 and 8.

Claim 26 with element numbers present, ala the July 2003 amendment, reads as follows:

-- 26. Apparatus for reducing the fluid-dynamic base drag of a bluff body (20) moving through a fluid (21) and creating, at the rear of the body, a low pressure wake having an outer wake perimeter, which bluff body (20) has a substantially flat rear base surface (25), a pair of opposed side surfaces (22A and 22B), and opposed top and bottom surfaces all joined with said rear base surface at side, top and bottom trailing edges (24), respectively, so as to form a box-like container (30), said apparatus comprising:

means positioning side-by-side vortex generators in a linear array (40) ahead of the two side, top and bottom trailing edges (24) of said bluff body (20) for generating counter rotating stream-wise



vortices in a fluid boundary layer (23) passing generally along said bluff body and creating from said layer separated shear surfaces (26) which turn sharply inward aft of said trailing edges (24);

four boattail plates (50) inset and affixed a predetermined distance from the top and side trailing edges (24); and

rear edges on said boattail plates (50) sized to intercept the separated shear surfaces (26) at the outer perimeter of the low pressure wake, thereby providing maximum fluid-dynamic base drag reduction for said body. --

Claim 27 is a dependent claim and reads as follows:

27. The apparatus in accordance with claim 26 wherein the bluff body is a land vehicle moving in air, which vehicle has only three boattail plates attached adjacent the top and opposed side trailing edges; and

three linear arrays of vortex generators, one array each associated with one each of said boattail plates.

These claims are clear from any ambiguity and use generally accepted terminology for this art.

The Manual of Patent Examining Procedure has not been followed by Examiner Patel. As there stated:

Before final rejection is in order a clear issue should be developed between the examiner and the applicant....Present practice does not sanction hasty and ill-considered final rejections. The applicant who is seeking to define his or her invention in claims that will give him or her the patent protection to which he

or she is justly entitled should receive the cooperation of the examiner to that end, and not be prematurely cut off in the prosecution of his or her case.

The examiner should never lose sight of the fact that in every case the applicant is entitled to a full and fair hearing, and that a clear issue between applicant and examiner should be developed, if possible, before appeal. However, prosecution of a case [is] to be confined to as few actions as is consistent with a thorough consideration of its merits.

Moreover, in a statement particularly applicable to this case, the MPEP in Section 706.07(a) specifically warns about a second action final when it states:

.....[O]ne would reasonably expect that a rejection under 35 USC 112 for the reason of incompleteness would be responded to by an amendment supplying the omitted element.

In the present situation, Applicant and his Attorney both tried in vain to supply not only another Amendment but a supporting Declaration. Both were summarily ignored and refused consideration. Indeed, one is left with the distinct impression that Examiner Patel does not understand any of the inventive features.

In any event, however, 35 USC 112 issues certainly have not yet been fully developed. Has the work load at the Patent Office become so heavy that an Examiner no longer has time to do his job? One certainly hopes not. Invention has contributed greatly

to this countries' advance and a thorough consideration in the Patent Office is owed both to the public in general, but to inventors in particular.

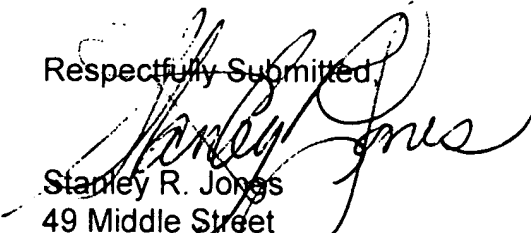
## **Conclusion**

It is respectfully submitted that all inventors - particularly those who try to prosecute their own case - should not receive premature final rejections. In such cases, in particular when the inventor is prosecuting his own case, the Examiner must try extra hard to be of assistance to that inventor. After all, while second action finals may be the desired norm, the Manual, fairness and justice all recognize that there must always be exceptions to the generally desired procedure. Examiner Patel obviously does not understand or want to meet these extra objectives.

For the above-stated reasons, it is believed that this Petition for Reconsideration regarding the 35 USC 112 rejection should be granted. Additionally, it is respectfully submitted that both the Amendment and the supporting Basford Declaration filed on July 26, 2003 should be entered in the record.

Granting this Petition will allow a clear issue to be developed for purposes of Allowance or Appeal. An Appeal will be noticed within the six month statutory period from the date of the Final Rejection or before November 27, 2003.

Respectfully Submitted,



Stanley R. Jones  
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November 26, 2003 (DEPOSIT DATE)

BY:  (REG. REP. REG. NO. 22,659.)



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Basford, William C.	)	Patent Examiner:
	)	Patel, Kiran B.
Filing Date: June 8, 2001	)	
	)	ART UNIT: 3612
Serial No.: 09/877,585	)	
	)	
For:	)	
	)	November 25, 2003
<b>AERODYNAMIC COMBINATION FOR</b>	)	Hallowell, Maine
<b>IMPROVED BASE DRAG REDUCTION</b>	)	Zip: 04347
-----	)	

NOTICE OF APPEAL

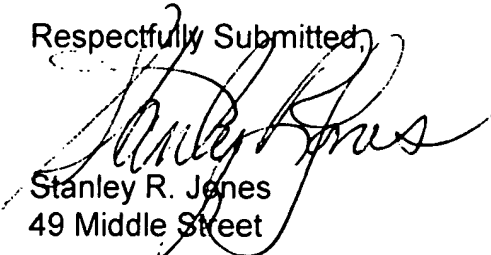
Applicant concurrently herewith has filed a Request for Reconsideration of a 35 USC 112 final rejection date May 27, 2003.

Additionally, Applicant hereby notices an appeal from:

1. The final rejection dated May 27, 2003 under both 35 USC 112 and 35 USC 103(a);
2. The refusal to include claim 30 among the Examined claims.
3. The entry of the Election/Restriction requirement dated September 24, 2002.

A fee check in the amount of \$165.00 is included herewith.

Respectfully Submitted,

  
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November 25, 2003 (DEPOSIT DATE)

BY:  (REG. REP. REG. NO. 22,659.)

ENCLOSED RE BARFORD SERIAL NO:

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- ① Petition for Reconsideration  
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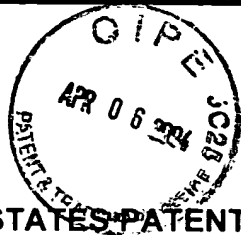
NOTICE APPEAL - BARFORD

Stanley R. Jones MP

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Basford, William C.	)	Patent Examiner:
	)	Patel, Kiran B.
Filing Date: June 8, 2001	)	Art unit: 3612
	)	
Serial No.: 09/877,585	)	
	)	January 26, 2004
AERODYNAMIC COMBINATION FOR	)	Hallowell, Maine
IMPROVED BASE DRAG REDUCTION	)	Zip: 04347
-----	)	

BRIEF ON APPEAL



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Basford, William C.

Filing Date: June 8, 2001

Serial No.: 09/877,585

**AERODYNAMIC COMBINATION FOR  
IMPROVED BASE DRAG REDUCTION**

Patent Examiner:

Patel, Kiran B.

Art unit: 3612

January 26, 2004

Hallowell, Maine

Zip: 04347

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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	)	Patel, Kiran B.
Filing Date: June 8, 2001	)	Art unit: 3612
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Serial No.: 09/877,585	)	
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For:	)	<b>APPEAL BRIEF</b>
	)	
<b>AERODYNAMIC COMBINATION FOR</b>	)	January 26, 2004
<b>IMPROVED BASE DRAG REDUCTION</b>	)	Hallowell, Maine
-----	)	Zip: 04347

**1. INTRODUCTION.**

This Brief on Appeal is being filed in response to the Office Action dated May 27, 2003 finally rejecting claims 26 through 29 and 31 through 35 in the above-identified Application.

This Brief is based upon the documents of record on file including an Appendix attached hereto. The Appendix includes the rejected claims, plus additional claim 30, which latter claim is believed to have been erroneously withdrawn by Examiner Patel. The Appendix also includes, for the convenience of the Board, two specific prior art patents relied upon in the final Rejection, plus a limited selection of certain other background art believed to be of assistance to the Board in making its determination.

**2. STATUS OF THE CLAIMS.**

There are presently at issue a total of nine claims, of which, claims 26 and 35 are independent and the rest are dependent. (Claim 30 is

dependent from claim 27 and thus should be included upon Appeal.) All of these claims are apparatus claims, with claims 26 and 35 being the broadest. Claim 35, in particular, was drafted to define a generic claim encompassing a species (Basford Figure 7) that the Examiner declared was withdrawn from consideration.

The claimed invention was originally defined in a utility Application that was self-filed by inventor Basford based upon two of his earlier Provisional Applications. At the time of first Examination the Application included 13 Figures, 18 original claims, specification of almost 50 pages, 23 non-patent references and 10 patent references. Examiner Patel then added another 29 patent citations in his first Office Action. This body of 62 prior art references - rather than being disabling - is believed to be a strong testimony to the merit, strength and novelty of the invention.

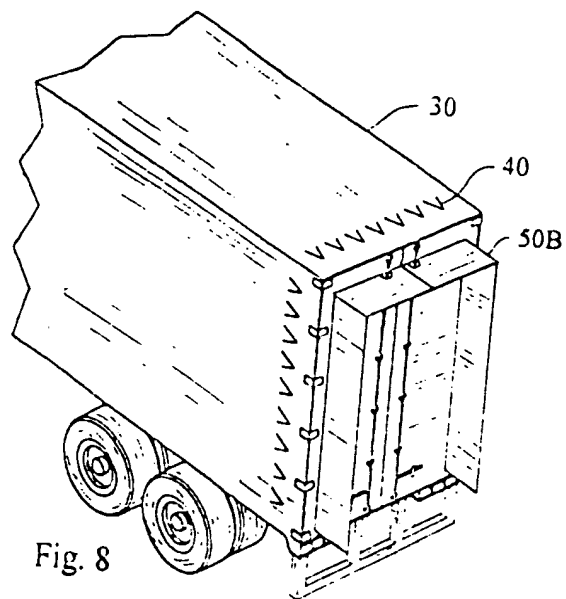
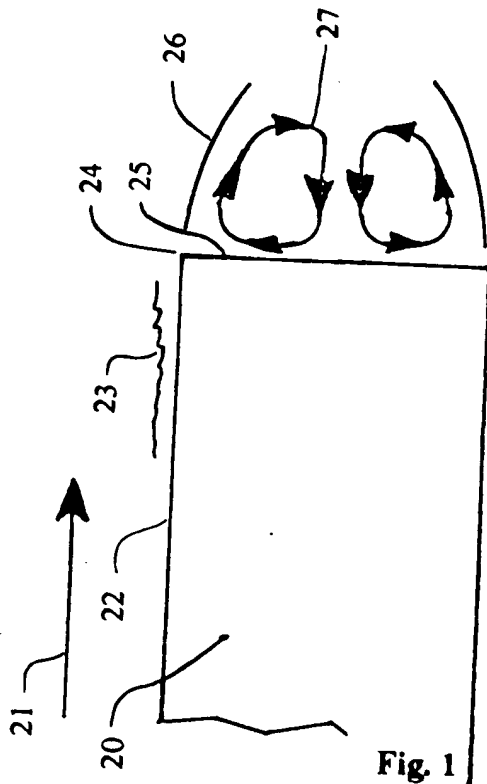
### **3. STATUS OF AMENDMENTS.**

Only one amendment dated March 20, 2003 has been entered. An after final-amendment dated July 26, 2003 and an accompanying Declaration by the inventor, William Basford, were denied entry.

### **4. SUMMARY OF THE INVENTION.**

As the title indicates, the invention is directed to an aerodynamic combination adapted for attachment at the rear end of a truck body in order to reduce drag on the truck body. The invention - a novel combination of vortex generators and shortened boattail plates - significantly reduces base drag; and, thus, improves the "miles-per-gallon" fuel consumption with a minimum of inconvenience to otherwise normal truck operation.

Basford Figure 1 and the inventive vortex generator and boattail plate embodiment of Basford Figure 8 are set forth below.



In this aerodynamic art, fluid-dynamic base drag refers to a phenomenon created at the rear of a body moving through a fluid, which drag hinders the efficiency of the movement of the body through the fluid. Aerodynamically speaking, a bluff body is, by definition, any body where the pressure drag, which includes both forebody drag and afterbody, or base drag, is greater than the skin friction drag. In accordance with this definition, all common highway trucks of the type in the Basford specification are bluff bodies.

As an aid to the Board's understanding, a glossary of terms is included in the Appendix, which glossary fully defines certain terminology necessary for a full appreciation of the invention. The definitions set forth in the glossary are common terms well known to artisans in the aerodynamic art. In some cases, the source for term's definition is set forth as well.

It will be shown herein that Basford has invented a new and novel combination that has significant advantages over all of the known art. The art pointed away from what Basford has done. His vortex generator and boattail plate combination has the unexpected results that it:

- Provides greater base drag reduction than the prior art while at the same time allowing almost conventional truck operation with less rear truck door obstruction.
- Shortens the boattail plates by over 50% of the prior art rearward extension length compared to that when such plates are used alone.
- Achieves this greater base drag reduction without requiring added vehicle length or conflicting with current U.S. regulations for trailer underride bars.
- Provides greater base drag reduction with the addition of a simple device that is easily installed on existing semi-trailer and other trucks.

## **5. ISSUES.**

5.1 Can a meritorious invention be defeated by an Examiner's action in ignoring the critical difference between boattail plates and other prior art boattail types?

5.2 Should specific and material limitations in claims which point in a direction opposite from the art, be disregarded in favor of prior art that admittedly lacks any suggestion for the inventive combination?

5.3 When one reference totally lacks disclosure of a key element of the claimed combination invention, should that reference be arbitrarily merged with the disclosure of another prior art reference when neither reference suggests that their disclosures might supplement each other?

5.4 Can a commercially viable breakthrough invention be defeated by an Examiner's simple unsupported assertion of obviousness without specifying how or why the references should be merged together against the claimed invention?

## **6. GROUPING OF CLAIMS.**

The final rejection grouped all of the claims together and stated that "Claims 26 - 29, 31 - 35, as best understood, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. There is presently pending a Petition for Reconsideration under 37 CFR 1.181. That Petition was submitted on November 25, 2003 and the Glossary of Terms of the Appendix and supporting comments will shortly be submitted in a Supplement to that Petition.

The final rejection also rejected all "claims 25 - 29, 31 - 35, as best understood, under 35 U.S.C. 103(a) as being unpatentable over Switlik '059 in view of Wheeler '837". Claim 30 is dependent from Claim 27 and it is believed that it should also be included on Appeal.

Both the 35 U.S.C. 112 and 35 U.S.C. 103(a) rejections are dealt with in this Brief on Appeal. We submit that the obviousness rejection is in error since the references do not teach or suggest the claimed invention; and, it is also submitted, that the claim language is clear, unambiguous and properly defines the novel combination of vortex generators and shortened boattail plates, which combination Applicant believes is his invention.

## **7. ARGUMENT.**

Dealing first with the 35 USC 103(a) final rejection, the Examiner admitted that one reference - Switlik '059 - does not disclose a plurality of vortex generators. But, the Examiner continued, Wheeler '837 does disclose a plurality of V shaped vortex generators, and "it would have been obvious to modify the Switlik device to include a plurality of vortex generators as disclosed by Wheeler '837, to achieve the desire[d] level of base drag reduction for the bluff body".

Highly summarized, the Basford breakthrough in the art has been presented in the drawing. The background discussion centers around Figure 1, while the inventive vortex generator-boattail plate embodiment is described with respect to Figure 8.

Figure 1, above, is a schematic plan view of the rear end of a bluff body 20, with an arrow 21 showing the direction of fluid flow. Such flow includes boundary layers 23 which form along the side surfaces 22, and



become the separated shear surfaces 26 after passing the trailing edges 24 of the truck body. The flow pattern includes the closed arrow-headed recirculation bubbles 27 - also known as low pressure wake - which wake forms behind the base surface 25. Vortex generator arrays 40 (See Figure 8) cause the separated shear surfaces 26 to turn sharply inward thereby reducing the size of the low pressure wake 27.

In his specification at page 12 lines 7 through 10, Basford states:

In simple terms, vortex generators energize the relatively slow moving fluid in boundary layers, helping it turn inward more quickly behind the trailing edges of a bluff body.

Placing a rear edge of the boattail plates 50B (Basford Figure 8) at the outer perimeter of the low pressure wake, provides maximum fluid-dynamic base drag reduction for the truck body 30. This stated positioning of the rear edge in combination with linear arrays of vortex generators is critical to the Basford invention and is nowhere taught or suggested by the prior art. (Please see paragraphs 7 through 9, 12 and 16 of the Basford Declaration dated March 19, 2003.)

Claim 26 is a generalized case for a bluff body moving in a fluid, whereas claim 27 is more specific to a truck body moving in air.

26. Apparatus for reducing the fluid-dynamic base drag of a bluff body moving through a fluid and creating, at the rear of the body, a low pressure wake having an outer wake perimeter, which bluff body has a substantially flat rear base surface, a pair of opposed side surfaces, and opposed top and bottom surfaces all joined with said rear base surface at side, top and bottom trailing edges, respectively, so as to form a box-like container, said apparatus comprising:

means positioning side-by-side vortex generators in a linear array ahead of the two side, top and bottom trailing edges of said bluff body for

generating counter rotating stream-wise vortices in a fluid boundary layer passing generally along said bluff body and creating from said layer separated shear surfaces which turn sharply inward aft of said trailing edges;

four boattail plates inset and affixed a predetermined distance from the top and side trailing edges; and

rear edges on said boattail plates sized to intercept the separated shear surfaces of said fluid layer at the outer perimeter of the low pressure wake, thereby providing maximum fluid-dynamic base drag reduction for said body.

27. The apparatus in accordance with claim 26 wherein the bluff body is a land vehicle moving in air, which vehicle has only three boattail plates attached adjacent the top and opposed side trailing edges; and

three linear arrays of vortex generators, one array each associated with one each of said boattail plates.

Claims 26 and 27 were questioned by the Examiner who asserted - numbers three and four, notwithstanding - that:

It is not clear between claim 26 and claim 27 whether applicant is claiming three or four boattails. (Emphasis Added.)

It is highly instructive that Examiner Patel failed to appreciate the difference between "boattails" and "boattail plates" as described and claimed by Basford. The two structures are not the same, and Examiner Patel mistakenly glossed over the fact that Basford claimed boattail plates - not boattails.

The Basford specification clearly set forth and explained the distinct differences between Full Boattails, Truncated Boattails and Boattail Plates. The Examiner stepped into grave error right from the very

beginning when he concluded: either that boattails and boattail plates were the same thing, or that Basford was claiming boattails. In either event the Examiner was mistaken.

In his March 27, 2003 Declaration, inventor Basford, in paragraph 8, stated clearly and succinctly what his invention was by referring to shortened boattail plates. In Paragraph 8, Mr. Basford states as follows:

I acknowledge that both vortex generators and boattail plates were known in the art prior to my invention and I have so stated in my patent application. My invention differs from such art and may be summarized as a new and novel combination of vortex generators together with shortened boattail plates at the rear of bluff bodies with the size and positioning of the boattail plates providing greater base drag reduction, while reducing the optimum length or rearward extension of the boattail plates.

The Examiner failed to appreciate the significance of the Basford Declaration. Indeed, at no time in his written rejections, did the Examiner ever acknowledge the Basford Declaration or the various patentability arguments presented by counsel. As far as the record shows, it seems reasonable to seriously question if the Examiner even read them.

Then to top it off, the Examiner did not make reference to the closest prior art and failed to enter into any discussion concerning the nature of the prior art. It appears he selected 2 references from among 62 and arbitrarily combined them in order to get the Application off his desk and out of the way. It is respectfully submitted that the job of the Patent Office is to give a thorough examination in return for the fees paid by an

inventor, and then issue a patent if an extensive investigation shows that a patent is warranted. None of that happened here.

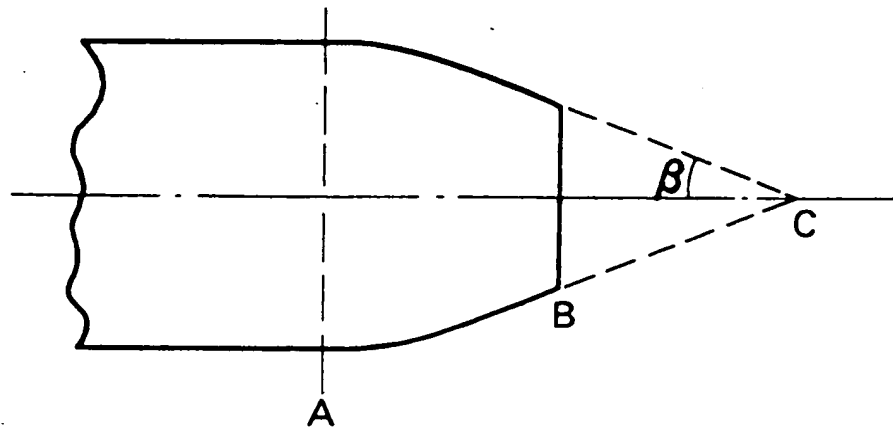


Fig. 5. Boat-tailed afterbody (Mair, 1969).

Set forth above is Figure 5 from a paper by W.A. Mair, entitled Drag-Reducing Techniques for Axi-Symmetric Bluff Bodies, showing a Truncated Boattail. The solid line portion AB of the Mair Figure 5 is a typical boat-tailed afterbody, terminating at a blunt base at section B. If the boattail structure were to continue along the dashed lines to point C then it would be a full boattail terminating at a point. In either event, however, it is clear that this Mair structure is of very little practical significance to the trucking industry.

Mair is one of a limited number of prior art references that sought to use vortex generators with boattail afterbodies. In his lengthy treatise, Mair concluded at page 177 as follows:

[I]t may be useful to consider whether some form of boundary-layer control (BLC) could be employed...

The easiest form of BLC to apply to a road vehicle would be a set of vortex generators, although this may be unacceptable for various practical reasons including safety. Experience with aircraft and other applications suggests, however, that even the best arrangement of vortex generators would have only a marginal beneficial effect, and it seems likely that the best boattailed afterbody using these devices would only be slightly better than one without them. (Emphasis Added.)

Although the prior art has steered others away, Mr. Basford dared to try; and, by going against those recognized in this field, the inventor Basford has shown them wrong. The Examiner's rejection should be withdrawn and a patent should issue.

Regarding boattails, Applicant's specification commencing at page 7, line 1 and continuing unto page 8, line 20, states in part:

Therefore the primary drawback of full boattails is that the maximum drag reduction requires extreme length, often three to four times the width of the bluff body, making full boattails impractical for highway vehicles.

x x x x

[F]ull boattails terminating in a point or narrow edge are rarely used.

At another specification heading at page 9, line 23, Basford set forth Boattail Plates and devotes over two pages to the development of such structure.

Figure 5 of the Basford specification is set out below. Figure 5 represents a prior art Figure showing the rear end of a typical full sized semi-trailer truck body 30, with three full length boattail plates 50 of the type disclosed by A. J. Bilanin in U.S. Patent No.: 4,682,808.

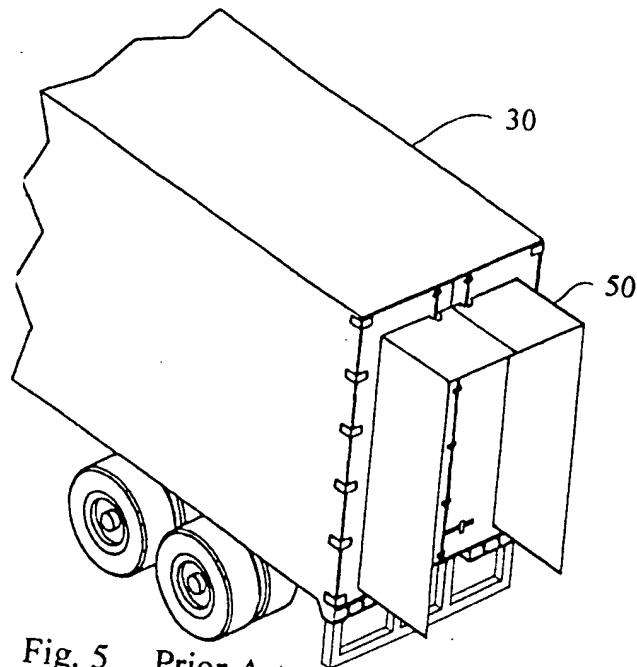


Fig. 5 Prior Art

According to Bilanin the minimum preferred length of these plates 50 should be forty (40) inches. Whereas that may be true for Bilanin's Boattail plates when used alone, Basford has determined that it is not true when Boattail plates are used in combination with low drag vortex generators. Such boattail plates can then be shortened by over 50% to a rearward extension length of about 1/6th the width of the bluff body, or shortened to about 17 inches for a typical full sized 102 inch wide semi-trailer body.

Claim 35 expresses this shortened boattail plate aspect of the combination invention of Basford in wording that is clearly allowable over all of the known art. It reads as follows:

35. Apparatus for reducing to a minimum the fluid-dynamic base drag of a bluff body moving through a fluid passing generally along said bluff body and creating, at the rear of the body, separated shear surfaces which define a low pressure wake having an outer wake perimeter, which bluff body has a substantially flat rear base surface with given height and width dimensions and a periphery of trailing edges, said apparatus comprising:

vortex generator means mounted adjacent to and forward of said trailing edges for generating counter-rotating stream-wise vortices in said fluid layer, which generators cause the separated shear surfaces to turn sharply inward thereby reducing the size of the low pressure wake, and

edge means coupled to said base surface and inset from said trailing edges for intercepting said separated shear surfaces at the outer perimeter of said low pressure wake, namely, at a distance behind said base surface of about 1/6th to 1/8th of said given height or width dimension, whichever is less. (Emphasis added.)

Examiner Patel apparently has little or no working knowledge in the field of the Aerodynamics of Bluff Bodies, and is unfamiliar with the standard terminology used in this art field. For example, in his second Office Action of Sept. 24, 2002, starting on the fifth line from the bottom on page 7, he made the statement:

It is not clear what is claimed as invention because elected Fig. 8 contains a truck body not a bluff body. The truck body has six (sides) flat base surfaces not one.

Anyone familiar with this art, however, would surely know that a truck body is a bluff body, and that, in terms of aerodynamics, the base surface is always the rearmost surface of the bluff body.

It is additionally enlightening to see the Examiner's statement on page 5 in the Office Action of May 27, 2003, where it is stated that:

Claims 26 - 29, 31 - 35 as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Switlik '059, in view of Wheeler '837."

This is essentially the same rejection earlier given by Examiner Patel in the first Office Action. In response to that first rejection, Applicant Basford prepared his Declaration under 37 CFR Section 1.132 which pointed out, among other things, that the boattail plates shown in Figs 1-17 of Switlik '059, clearly fall within the scope of Bilanin '808, and that the only new material asserted in Switlik '059 deals with the manner of folding and unfolding the full length boattail plates in order to make them easier to use.

Mr. Basford, a Registered Professional Engineer, licensed in Maine and Vermont, states as follows at paragraph 15 of his Declaration:

Such Switlik plates, in my opinion, simply follow the Bilanin '808 approach. .... Switlik discloses an improved way to more easily fold and unfold the boattail plates to allow access to the rear doors of a truck body. Switlik '059 provides no additional base drag reduction over Bilanin '808, and does not suggest any reduction of the optimum length of the boattail plates. Switlik '059 does not teach or suggest that vortex generators can be used in combination with shortened boattail plates to provide greater base drag reduction. (Emphasis added.)

This sworn testimony by Engineer Basford was never commented on nor considered before the 103(a) rejection was made final. One can look in vain throughout Switlik and never find any suggestion therein relating to any of the advantages of the Basford structure nor his inventive



concept. The final rejection is unsound, and a patent most surely should issue.

In his rejection under obviousness, on page 4 of the Office Action dated May 27, 2003, Examiner Patel also additionally made an offhand comment about base drag when he stated:

Therefore, it would have been obvious to ... modify the device, as disclosed by Switlik '059, to include a plurality of vortex generators, as disclosed by Wheeler '837, to achieve the desire[d] level of base drag reduction for the bluff body." (Emphasis and matter in brackets added)

The desired level of base drag reduction is obviously the maximum possible base drag reduction within legal limitations and other practical constraints such as cost and ease of use for highway vehicles.

The subject invention provides roughly 50% greater base drag reduction than either Bilanin's full length boattail plates or Wheeler's low drag vortex generators when used alone. (Please see Mr. Basford's Declaration paragraph 9.) It does so while simultaneously reducing the optimum length of the boattail plates by roughly half. Neither Bilanin, nor Switlik, nor Wheeler disclose this combination nor the increased benefits in base drag reduction. Indeed, none of these references make any suggestion that the novel Basford combination of vortex generators and shortened boattail plates is possible, much less highly desirable.

Section 706.02(j) of the Manual of Patent Examining Procedure (MPEP) sets forth the mandatory criteria for applying a 35 USC 103 rejection. Such criteria are totally absent in the final rejection of this case. Graham v John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966) is

controlling, but the Graham rationale was never followed in finally rejecting the Basford invention. The Examiner should have - but did not - set forth:

- A. the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s),
- B. the difference or differences in the claims over the applied reference(s),
- C. the proposed modification of the applied reference(s) necessary to arrive at the claimed subject matter, and
- D. an explanation why one of ordinary skill in the art at the time the invention was made would have been motivated to make the proposed modification.

Perhaps because of workload - or other reasons not apparent from the record - the above-noted guidelines A through D were ignored in this case. In particular, we are left wondering why one of ordinary skill in this art would have combined Switlik and Wheeler. One thing that is very clear, however, there is absolutely nothing in either Switlik or Wheeler that suggests the disclosures of these references should be combined.

Mr. Basford, in paragraph 11 of his March 19, 2003 Declaration forcibly stated as follows:

It is my technical opinion that these references [Switlik and Wheeler] lack any instructions that would direct one of ordinary skill toward my invention. (Matter in brackets added.)

The initial burden is on the Examiner to provide some suggestion for the desirability of doing what the inventor has done. The case of Ex

Parte Clapp, 277 USPQ 972, 973 Bd. Pat. App. & Inter. 1985) summarized the law as follows:

To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to be obvious in light of the teachings of the references.

Nothing of that sort has happened in the case at bar. The final rejection must be removed.

To establish a prima facie case of obviousness, it is important that the prior art reference (or references when combined) must teach or suggest all the claim limitations. Finally, the teaching or suggestion to make the claimed modification and the reasonable expectation of success must be found in the prior art and not based upon Applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed Cir. 1991). It is respectfully submitted that only after reading and understanding the Basford specification did the Examiner piece together two marginally relevant patents for his obviousness rejection. What the Examiner has done is use Applicant's own specification against himself to Applicant's great detriment. That is prohibited hindsight and is wholly unfair to the inventor Basford.

As noted by the inventor in paragraph 10 of his Declaration, his invention, if adopted Nationwide would cause enormous savings to the long haul trucking industry. For example, Basford reasoned as follows:

[L]ong haul trucks consume over 16 Billion gallons of Diesel fuel per year in the U.S. Reducing the total aerodynamic drag of these trucks by about 15% will yield about 10% in fuel savings. If this invention achieves widespread use on long haul trucks, the potential fuel savings is well over one billion gallons per year, with corresponding air pollution savings. At current Diesel fuel prices of \$2 per gallon, as of mid March 2003, the potential fuel cost savings is over \$2 Billion per year for the trucking industry alone.

Claims 26 through 29 and 31 through 35 were rejected based upon an unfounded assertion that they are "indefinite" and that the claim language used "has failed to particularly point out and distinctly claim the subject matter which applicant regards as the invention." Not so.

In the specification, Mr. Basford carefully explained his invention and also explained the terms used to define the novel features of his invention. There is pending a Petition for Reconsideration under 37 CFR 1.181 relative to the 35 USC 112 rejection. That Petition will be supplemented by the Glossary of Terms submitted herewith. Suffice to say here that the rejection/objection by the Examiner is not well founded.

In his final rejection under 35 USC 112 the Examiner stated:

Claim 26, lines 2 - 3, "a low pressure wake having an outer wake perimeter"; lines 8 - 10 "means positioning side by side vortex generators in a linear array ahead of the two side, top and bottom trailing edges of said bluff body for generating counter rotating stream-wise vortices; and lines 15 - 17 "rear edges on said boattail plates sized to intercept the separated shear surfaces of said fluid layer at the outer perimeter of the

low pressure wake thereby providing maximum fluid-dynamic base drag reduction for said body" fails to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is respectfully submitted that the problem may well be that the Examiner is simply unfamiliar with the technical terminology commonly used in the field of aerodynamic drag reduction. Applicant responded to the Examiner by amendment filed on July 25, 2003 and specifically inserted into claim 26 the exact reference numbers for appropriate elements of his inventive Figures, and explained their applicability to the claim language. Please see, for example, the discussion starting on the last paragraph of page 14, page 15, and the top of page 16 of that non-entered amendment.

Furthermore, in the "Remarks" section of that July amendment, reference was made to the applicable Figures 2 and 3 of the Wheeler reference. The Wheeler figures were inserted into claim 26 at the appropriate place in order to show exactly how the invention accomplished the novel result heretofore unappreciated by the art. Nevertheless, the Examiner remained steadfast in his refusal to consider Applicant's efforts. When an Applicant has done all possible in a sincere effort to lead and assist, the resulting failure by the Examiner to read or communicate must surely lead to Appeal.

Terms such as base drag, base surface, boundary layer, trailing edge, separated shear surface, and low pressure wake, all have specific meanings that are well recognized, clearly understood and commonly used by all artisans working in the field of aerodynamic drag reduction. These terms are fully defined in the specification and in the accompanying Glossary of Terms. Anyone of ordinary skill in this art reading the claims

at issue would immediately recognize the contribution to this art made by the present invention.

These facts notwithstanding, Mr. Patel consistently ignored Mr. Basford's first (and second Declaration as well) and failed even to acknowledge that such Declarations were submitted. Not only that, but Mr. Patel has missed the most pertinent art which Mr. Basford has cited and explained at length.

In clear contrast to Mair and the other art, Basford teaches moving the rearward edge of shortened boattail plates roughly 50% closer to the rear of the truck. Such a simple step -- by hindsight -- provides both novel and commercially viable savings. Basford's unique edge location (whether boattail plates or a trailing panel of withdrawn Figure 7 and generic claim 35) works to provide greater drag reduction than the prior art. The Basford structure thus satisfies several significant criteria for a patentable invention.

Mr. Basford discovered that vortex generators, ala the Wheeler disclosure, cause the separated shear surfaces (elements 26, above) to sharply swing inward just aft of the trailing edges 24 of the bluff body. Basford combines known linear vortex arrays with boattail plates having rear edges placed so as to intercept those separated shear surfaces at the outer perimeter of the inwardly-turned (and smaller) low pressure wake. The location and positioning of these rear edges is much closer to the base surface of the trailer body than Bilanin, or Switlik or any other known art teaches or suggests.

Combining vortex generators and boattail plates is novel over the art. With a truck body moving in air (Claim 27), maximum base drag reduction is achieved when the rear edges of the three shortened boattail

plates are positioned in a rearward direction at about  $1/6$ th the width of the truck's rear surface. (Please see Claim 31 and generic claim 35 which set forth that novel dimensional relationship in varying terminology.)

The art relied upon by the Examiner is Switlik '059 in combination with Wheeler '837. What is lacking in such art is the precise combination of linear arrays of vortex generators in combination with boattail plates, as claimed. Moreover the critical rearward extension length of about  $1/6$  the width of the base surface (assuming width less than height, as usually is the case) is not suggested by such an art combination.

Inventor Basford defines the size of his shortened boattail plates so that the rear edges of such plates intercept the separated shear surfaces after those shear surfaces have passed over the vortex generators, with the rear edges of the boattail plates being located at the outer perimeter of the low pressure wake. This novel, and heretofore unknown combination, provides maximum fluid-dynamic base drag reduction for a bluff body. That novel combination constitutes the crux of the Basford invention. One wonders if these aerodynamic improvements can be presented in any clearer terminology. The claimed invention is presented in clear and concise terms, and is neither vague nor indefinite. Moreover, the invention is easily understood by anyone conversant with the basic aerodynamic terms.

In short summary, what has not been recognized before this novel invention, was that combining the two techniques - vortex generators and shortened boattail plates - would greatly improve base drag reduction provided that the extension length (ie. plate width, per se) of the boattail plates was about  $1/6$  of the width of the base surface.

Using the truck examples of the specification, the outside width of the rear base surface is about 102 inches, and the inventive  $1/6$  of 102 inches is about 18 inches. (It is  $1/8$ th, or about 12 inches in Basford Fig. 9, in order to comply with the Department Of Transportation Regulations for trailers built after January, 1998). This Basford improvement is a far cry from the 40 to 56 inches of the prior art, including Bilanin at Column 9, lines 14 through 17, Switlik and the other references. The Basford invention is clearly novel over such art.

Note that this critical " $1/6$ th the base width feature" (or " $1/8$ th" in Basford Fig. 9) is clearly specified in some of the claims. The first Basford Declaration further sets forth ample reason why the prior art teaches away from this claimed distinction. In particular, the Basford Declaration confirms that independent Claims 26 and 35, for example, define a novel combination over all of the known and cited art.

As conceded by the Examiner, the Switlik reference is completely devoid of the Basford vortex generators for creating a smaller low pressure wake, which enables the separated shear surfaces to intercept the rear edges of the shortened boattail plates at a distance of only about  $1/6$  to  $1/8$  of the base surface width. Furthermore, nothing in Bilanin, Switlik or Wheeler suggests such a combination.

The Basford Declaration clearly explains these novel principles in carefully worded terminology defining a new and non-obvious solution to a problem which all prior artisans overlooked. If it were so readily obvious - as the Examiner contends - why is it not shown or suggested by the cited art? Instead, the cited art - Applicant respectfully submits - testifies to the worthiness, merit and novelty of the Basford invention. It clearly does not - as the Examiner contends - negate the claimed novelty.



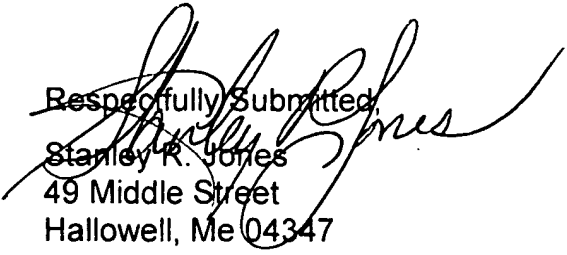
worthiness, merit and novelty of the Basford invention. It clearly does not  
- as the Examiner contends - negate the claimed novelty.

Inventor Basford has described and claimed his invention in as clear and concise terms as possible. Moreover, consistent with the requirement for full disclosure, Basford provided detailed information on the most relevant prior art, and all the needed technical background information for an appreciation of this highly significant invention. Additionally Applicant paid all the required fees. In return, the Patent Office Examiner must make a good faith effort to fully understand and examine the application on its merits. That good faith evaluation simply was not done.

None of the references, singularly or in combination, supply guidance or suggestion for combining Wheeler with Switlik or Bilanin or, indeed, any other of the known art. In short it is respectfully submitted that the claimed invention is useful, novel and not obvious to persons with ordinary knowledge and skill in this technology.

The Examiner should be reversed, the rejection withdrawn, and all of the claims allowed.

Respectfully Submitted,

  
Stanley R. Jones  
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Hallowell, Me 04347  
(207) 621 - 0477  
REG. NO. 22,659

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BY:  (REG. REP. REG. NO. 22,659.)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Basford, William C.	)	Patent Examiner:
	)	Patel, Kiran B.
Filing Date: June 8, 2001	)	Art unit: 3612
	)	
Serial No.: 09/877,585	)	
	)	January 26, 2004
<b>AERODYNAMIC COMBINATION FOR</b>	)	Hallowell, Maine
<b>IMPROVED BASE DRAG REDUCTION</b>	)	Zip: 04347
-----	)	

APPENDIX BOOKLET

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
Basford, William C.	)	Patent Examiner:
	)	Patel, Kiran B.
Filing Date: June 8, 2001	)	Art unit: 3612
	)	
Serial No.: 09/877,585	)	
	)	January 26, 2004
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-----	)	

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Glossary of terms.....	(Tab 2)
Switlik '059 & Wheeler '837.....	(Tab 3)
Mair Paper .....	(Tab 4)
Bilanin '808 .....	(Tab 5)



Attention Daniel Jones:

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of:	)	
	)	
Basford, William C.	)	Patent Examiner:
	)	Patel, Kiran B.
Filing Date: June 8, 2001	)	
	)	ART UNIT: 3612
Serial No.: 09/877,585	)	
	)	
For:	)	
	)	February 10, 2004
<b>AERODYNAMIC COMBINATION FOR</b>	)	Hallowell, Maine
<b>IMPROVED BASE DRAG REDUCTION</b>	)	Zip: 04347
-----	)	

Attention Daniel Jones: BY FAX: (703) 872-9306

Dear Ms. Jones,

We spoke by telephone today and I confirmed for you that I have timely and properly filed a Petition to the Commissioner under 37 CFR 1.181, a Notice of Appeal, a self-addressed return post card and a check for \$165.00 - my check No.: 3341. You have requested that I send copies of same to your attention by Facsimile at (703) 872 - 9306. I am sending them along with this letter.

If I may be of further service, please advise.

Respectfully submitted

SRJ

Stanley R. Jones